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ABSTRACT

Each of the 32 curriculum modules in this packet for ornamental horticulture instruction contains a brief description of the module content, a list of the major division or units, the overall objectives, objectives by units, content outline and suggested teaching methods, student application activities, and evaluation procedures. A listing of resource materials is also included for each module. Module titles are Climbing, Limbing, and Felling; Pruning Ornamentals; Floral Design and Construction; Funeral Spray and Wreath Construction; Funeral Designs; Simple Wedding Designs; Producing Christmas Decorations; Retail Flower Shop Operation and Management; Introduction to Growing Greenhouse Crops; Growing Bedding Plants; Growing Specialized Greenhouse Holiday Crops; Ornamental Horticulture--Landscape Design; Landscape Construction Features; Indoor Landscaping; Identifying and Using Indoor Foliage Plants; Implementing Landscape Plantings; Maintaining Woody Shrubs in the Landscape; Identification and Landscape Use of Herbaceous Plants; Growing Nursery Plants; Asexual Plant Propagation; Plant Propagation From Seed; Growing and Caring for Turf Grass; Lawn Construction; Greenskeeping; Controlling Insects, Diseases and Fertilization; Preparing and Maintaining Ornamental Horticulture Soils; Using Woody Plants in Ornamental Horticulture; Developing an Ornamental Business Location and Layout; Preparing Nursery Stock for Sale; Operation and Maintenance of Horticultural Equipment; Scheduling Greenhouse Crop Production; and Preparing Flowers for Sale. (HD)

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ornamental horticulture

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CE 009 337

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Bureau of Occupational and Career Curriculum
Albany, New York 12234

MODULE OF INSTRUCTION

Title - CLIMBING, LIMBING AND FELLING Code - 01.0501-01

DESCRIPTION

This module considers the estimating costs in safely pruning and felling trees located on landscaped residential, industrial, and public lands. Students develop skills in limbing and preparing trees for felling. Special skills such as selecting areas of trees to remove and cutting trees with power chain saws are developed by students. Knowledge and skills in the use of clippers, saws, pruners, chain saws, ropes, power stump removers, chippers and lawn vacuum cleaners are developed by students in removing trees, stumps and debris from property.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Estimating Costs of Tree Surgery	1	3
2. Tools and Equipment Used in Tree Surgery	1	3
3. Methods of Tree Climbing	1	4
4. Removing Major Limbs from Trees in Preparation for Felling and/or Disease Control	1	8
5. Felling and Removing Trees, Stumps and Debris		8
	4	26

Revised June, 1974

MODULE OF INSTRUCTION

Title - CLIMBING, LIMBING AND FELLING Code - 01.0501-01

OBJECTIVES to be obtained:

The student will able to:

1. Given a specific tree, cost per man hour, and a depreciation cost for equipment, estimate showing all work, the time, and cost of removing the tree, stumps and debris from the premises on a written or oral test as accurately as possible.

2. When given the hand tools used in tree surgery, identify them with 95% accuracy on an oral or written test and use each in the field properly observing all safety precautions.

3. Identify the functions of power equipment used in tree surgery on a written or oral test with 95% accuracy and use and maintain this equipment properly observing all safety precautions.

4. With the use of rope and saddle, climb and maneuver in a tree competently observing all safety precautions.

5. Identify and state the types of power lifts, climbing spikes and safety belts with 95% accuracy on a written or oral quiz and be able to operate all properly observing all safety precautions.

6. Given a specific tree and limb of that tree and provided with the necessary equipment and supplies, climb the tree, remove the limb and dress the wound correctly observing all safety precautions.

7. Given a specific tree and a chain saw, properly undercut and fell the tree observing all safety precautions.

8. Given a fallen tree, properly cut up and remove the tree, debris and stump observing all safety precautions.

Title - CLIMBING, LIMBING AND FELLING

OBJECTIVES BY UNIT	CONTENT
1. Estimating Costs of Tree Surgery Objective 1 Given a specific tree, cost per man hour, and a depreciation cost for equipment, the student will estimate showing all work, the time and cost of removing the tree, stump and debris from the premises on a written or oral test, as accurately as possible.	A. Operating a tree surgery business . Costs of tools and equipment . depreciation . Overhead . Labor . full-time . part-time . Insurance . compensation . liability B. Setting up examples for estimating time and costs involved
2. Tools and Equipment Used In Tree Surgery Objective 2 When given the hand tools used in tree surgery, the student will identify them with 95% accuracy on an oral or written test and use each in the field properly observing all safety precautions.	A. Basic hand tools used in tree surgery . Chain saws . Hand saws . Pole pruner and pole saw . Pruning shears . hand (secular) . lopping . Axe B. Safe use of the basic hand tools.
Objective 3 The student will identify and state the functions of power equipment used in tree surgery on a written or oral test with 95% accuracy and use and maintain this equipment properly, observing all safety precautions.	A. Power equipment used in tree surgery . Chippers . Power stump removers, backhoe, bulldozer . Lawn vacuum cleaners B. Use, maintenance and safety precautions of power equipment *If chipper and power stump remover are not available contact Davey Tree Co. or similar company for a demonstration.
3. Methods of Tree Climbing Objective 4 With the use of rope and saddle the student will climb and maneuver in a tree. On a written or oral quiz state how to select the proper rope for the job desired and in the field with the use of rope and saddle the student will climb and maneuver in a tree competently observing all safety precautions.	A. Select the proper rope for job desired . Type . circumference (inches) . diameter (in) . breaking load (lb) . safe load (lb) . number of strands . life expectancy B. Use and care of ropes . Knots used in climbing . Slings . Coil and uncoil rope . Care and storage of climbing ropes C. Saddle board D. Safety precautions used in climbing

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discuss with class using the overhead projector B. Hand out work sheets and discuss with class C. Have a guest speaker from one of the tree surgery businesses in your area D. Outdoor tour of actual examples	A. The student will estimate time requirements and costs of removing tree from a site. B. The student will be able to state the essential parts of a tree surgery business.	A. The student will be evaluated on accuracy in computing costs and time requirements. B. Written or oral quiz on the operation of a tree surgery business
A. Lecture and discuss with class using catalogs from different companies B. Demonstrate proper use and safety precautions to observe during lab C. Field trip to an area where a tree surgery business is in operation D. Guest speaker from a local tree surgery business	A. The student will be able to properly name and use all tools for tree surgery B. The student will be able to develop skill in using tools during lab	A. Student will be given a written or oral quiz on identification and use of all tools B. Student will name and demonstrate proper use of all tools in the field observing all safety precautions.
	A. The student will be able to identify and describe the power equipment used in tree surgery B. The student will observe and operate all power equipment for tree surgery C. The student will be able to observe safety precautions taken during operation of equipment	A. Quiz students on identification of power equipment and its uses. B. Student will demonstrate his ability to operate all equipment safely and properly
A. Lecture and discuss with class using the overhead projector B. Demonstrate to class in lab C. Guest speaker from a local tree surgery business D. Field trip to a local tree nursery business	A. The student will climb and move about the various parts of a tree with the use of rope and saddle. B. The student will be able to state the safety precautions used in tree climbing	A. Written or oral quiz on ropes and safety precautions B. Observation of the student while climbing and moving about in the tree C. Check list on safety precautions

Title - CLIMBING, LIMBING AND FELLING

OBJECTIVES BY UNIT	CONTENT
Objective 5 The student will be able to identify and state the types of power lifts climbing spikes, and safety belts with 95% accuracy on a written quiz and be able to operate each properly observing all safety precautions.	A. Power lifts . Types . Use and maintenance . Safety precautions B. Climbing spikes and safety belts . Types . Use . Safety precautions C. Ladders . Types . Use . Safety precautions
4 . Removing Major Limbs from Trees in Preparation for Felling and/or Disease Control Objective 6 Given a specific tree and limb of that tree, and provided with the necessary equipment and supplies, the student will climb the tree, remove the limb and dress the wound correctly, observing all safety precautions.	A. Climbing a tree, removing and dressing a limb . Use of ropes for guiding limb . Cutting of limbs . diameter of limb . undercut . back cut (second cut) . Removal of limb . Removal of stub . Dressing of the wound . paint . tar . cement . other

EDUCATION

01.0501-01 - Code

CLIMBING, LIMBING AND FELLING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discuss with class using the overhead projector B. Demonstrate the different types and uses of power equipment for tree surgery in lab C. Guest speaker from local tree surgery business D. Hand out catalogs and discuss the various types of equipment with class E. Field trip to a local tree nursery business and have them demonstrate their equipment for class	A. Students will be able to identify and describe the techniques of using all the various types of equipment covered in class or lab B. Students will be able to use and follow safety precautions when operating equipment C. Students will be able to observe and take notes on field trip when visiting a local tree surgery business	A. Students will demonstrate their ability to operate all equipment safely and properly B. Quiz students on methods of climbing and safety precautions for power equipment
A. Lecture and discuss with class using the overhead projector B. Hand out sheets for proper pruning techniques and discuss with class C. Field trip to an area where a tree surgery business is in operation D. Demonstrate procedure for climbing, removal of limbs and dressing in lab	A. The student will develop skills in tree climbing, proper methods of limb removal and proper dressing of the wounds.	A. The student will be evaluated by the instructor for climbing ability, placement of cuts and dressing techniques used in lab or on a job and observe all safety precautions.

Code - 01.0501-01

A G R I C U L T U R A L

Title - CLIMBING, LIMBING AND FELLING

OBJECTIVES BY UNIT	CONTENT
5 . Felling Trees	A. Procedure for undercutting and felling trees . Size and condition of tree . Direction of fall . physical factors . lean of tree . other trees in area . slope of ground . wind conditions . Retreat path to follow when tree begins to fall . Check tree for dead branches and loose bark . Good footing . Stand directly behind saw . Undercut is made first . approximately 1/3 diameter of the tree . Back cut . Wedges B. Use of ropes and push poles for guiding fall . Winches . Vehicles C. Safety precautions in felling trees . Condition of saw . Clothing . Proper procedure for cutting
Objective 8 Given a fallen tree, the student will properly cut up and remove the tree, debris and stump observing all safety precautions	A. Cutting up of the tree . Limbing . cuts should be at the crotch or top side of branch . start at base of trunk . cut close to trunk . size of branch . stand on opposite side of trunk when using axe or chainsaw . Bucking . stand to one side of the saw not behind it . clear away brush . don't allow saw to bite into dirt . when working on sloping ground, stand uphill . avoid binding or pinching of saw . plan before cutting . Removal of logs or parts . load by hand . loader . chipper . Clean up debris . hand rakes . power vacuum cleaner . Stump removal . power stumper . backhoe . bulldozer

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discuss with class using the overhead projector B. Field trip to an area where a tree surgery business is felling trees C. Demonstrate procedure for cutting and felling trees during lab D. Guest speaker from a local tree surgery business demonstrate cutting and felling of trees to class	The s tudent will develop skills in the use of chain saws by undercutting and backcutting while felling trees. He will obtain practice in the methods of guiding the fall of trees.	A. The student will follow safety precautions while determining placement of undercut and position of the fallen tree. B. The student will safely and effectively fell a tree observing all safety precautions
A. Demonstrate procedure for bucking and limbing trees during lab B. Field trip to an area where a tree surgery business is limbing and bucking trees C. Lecture and discuss with class using the overhead projector D. Guest speaker from a local tree surgery business to demonstrate limbing and bucking to class	The student will be able to safely and effectively fell, limb, and buck trees using proper equipment and methods	A. The student will safely and effectively limb, and buck trees with proper equipment and methods.

MODULE OF INSTRUCTION

Title - **CLIMBING, LIMBING AND FELLING** Code - 01.0501-01

RESOURCE MATERIALS

Books:

Teacher references

1. Blair, Millard F. Practical Tree Surgery.
   Boston, Mass., Christopher Publishing House.
   pruning - pp. 209 - 214
   ropes and knots - pp. 258 - 267

2. Fenska, Richard R. Tree Experts Manual.
   New York, N. Y., A. T. DeLa Mare Co., Inc., 1943.
   pruning - pp. 55 - 61
   dressings - pp. 62 - 64.

3. Haller, John M. Tree Care. New York, N. Y.
   The McMillan Co. 1957. $5.95.
   pruning - pp. 53 - 67
   tool s and equipment - pp. 208 - 209.

4. Pirone, P. P. Tree Maintenance. New York, N. Y.
   Oxford University Press. 1959.
   pruning - pp. 65 - 78
   tools - pp. 67 - 69
   dressings - pp. 80 - 84.

5. ___________. Trees - The Yearbook of Agriculture.
   Washington, D. C., U. S. Government Printing
   Office. 1949.
   tree felling - p. 241.

6. _________. New Illustrated Encyclopedia of Gardening.
   New York, N. Y. Greystone Press.
   pruning - pp. 1689 Vol. 10 (well illustrated)
   tree felling - pp. 2321 - 2322 Vol. 13.

Student references

Books 1 through 4 are all good reference sources. A copy of one of them should be available to the students.

RESOURCE MATERIALS (continued)

Bulletins:
Teacher references

Cornell Agricultural Education Instructional Materials Service

1. Chain Saw Technician Workbook. No. C16
   Ken Cook Transnational. 1968. $9.50.
2. Beautiful Home Grounds. No. H 17
   Mich. 1967. $0.30.
   pruning - pp. 30-32.
3. Pruning Shade Trees. No. H 21
   Illinois. $0.10.
   pruning, ropes and knots
4. Pruning Ornamental Trees and Shrubs. No. H 23
   Cornell. 1967. $0.15.
   pruning.

U. S. Dept. of Interior, National Park Service

5. Tree Preservation Bulletin No. 2
   Safety for Tree Workers. Washington 25, D. C.
   Superintendent of Documents, U. S. Government Printing Office.
   1956. $0.20.
6. Tree Preservation Bulletin No. 4
   Washington 25, D. C. Superintendent of Documents, U. S. Government
   Printing Office. $0.15. ropes and climbing.

Student references
Numbers 3, 5, and 6 from teacher references.

Periodicals:
Teacher references

1. Trees Magazine. 7621 Lewis Road, Olmsted Falls, Ohio 44138.
2. Grounds Maintenance. Intertec Publishing Corp., 1014 Wyandotte Street,
   Kansas City, Mo. 64105.

Student references
Numbers 1 and 2 from teacher references.

MODULE OF INSTRUCTION

Title - PRUNING ORNAMENTALS

Code - 01.0501-02

DESCRIPTION:

The student will be familiar with a plant's growth cycle and plant parts. Student will become acquainted with the common pruning tools, their purpose and use. During field trips the student will be able to identify ornamental plants. The student will be able to differentiate between properly and improperly maintained plantings. The student will discuss and identify natural forms as well as disciplined forms used in landscaping. In visiting various landscape plantings the student will be able to identify the design objective and prune the planting to accomplish the intended objective.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Identification and understanding the various parts of a plant and their function understanding the growth cycle of plants	1	2
2. Identification of the 4 major classifications of ornamental woody plants	1	2
3. Recognizing natural plant forms and their relative forms and size within a landscape	2	3
4. Pruning tools and their use		9
5. Objectives and timing of pruning, demonstrating pruning skills	1	9
	5	25

Revised June, 1974

MODULE OF INSTRUCTION

Title - PRUNING ORNAMENTALS

Code - 01.0501-02

OBJECTIVES to be obtained:

The student will be able to:

1. Identify the various portions of a plant and describe their function.
2. Categorize plants in one of the 4 major classifications.
3. Recite the growth cycle and reproductive cycle within the 4 classifications.
4. Recite the intended function of plants in achieving a design objective in a landscape.
5. Demonstrate a knowledge of natural and controlled forms of various plants.
6. On visiting a landscape planting, select and effectively use the proper pruning tool for any given purpose.
7. Given a set of pruning tools, sharpen, adjust and sterilize his tools. In addition, he will be acquainted with and demonstrate safe handling and storage of his tools.
8. Demonstrate his pruning skills for attaining the 5 given pruning objectives in each of the 4 major classifications.
9. Remove a major limb and trace and dress a wound on a tree.

Module PRUNING ORNAMENTALS 01.0501-02

OBJECTIVES BY UNIT	CONTENT
1. Plant parts - interrelationship and pruning Objective 1 Given a plant the student will be able to identify the various portions of a plant and describe their function	A . Roots, stems, branching structure leaves, needles, flowers, fruit, buds B . Growth cycle of plants C . Movement of nutrients and water withinplant's system
2. Major classification of Ornamental woody plants Objective 2 Will be able to categorize plants in one of the 4 major classifications Objective 3 Will understand the growth cycle and reproductive cycle within the 4 classifications	A . Deciduous shrubs • Spring flowering • Summer flowering B . Evergreen shrubs • Broad leaved • Coniferous C . Coniferous trees D . Deciduous Trees • Ornamental • Major (street) E . Reproductive of deciduous plants • Monocats • Dicots F . Reproductive of evergreens • Coniferous • Broad leaved

PRUNING ORNAMENTALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Use of live plants B. Film C. Visual aids - bulletins, etc.	A. Understand functions of various parts of plants B. Understand growth cycle of plants recognize annual growth patterns of plants C. Differentiate between vegetative and reproductive buds D. Identification of terminal, latural, dorment latent and adventitious buds E. Identify undesirable growth i.e. water sprouts, suckers, etc. F. Identify new and old wood G. Assemble various specimens which clearly depict the various portions of plants. Portions of plants (branches) or entire plants can be used H. Select deciduous and evergreen materials to demonstrate with	The student should be able to identify and describe the functions of the various portions of several different plants
A. Use of -. . Slides . Films . Catalogs . Bulletins . Field trip B. Slides C. Films D. Samples of seeds, cuttings	A. To be able to classify plants into the major categories B. Field trips: . Visit park areas home sites . Institutional plantings, nurseries, garden centers. C. Student should note size variances within each category D. Student should observe basic forms and sizes E. Student should list plants observed into appropriate categories F. Students must understand the relationship between plant growth, pruning and the plant's ability to reproduce G. Students should trim different plants of the same species differently to be able to observe the effect on the growth and reproductive power of the plant	A. The student will be able to classify plants in each of the 4 major classifications and their sub-classification B. The student will be able to understand and describe the growth and reproductive cycle of plants

AGRICULTURAL

Module PRUNING ORNAMENTALS 01.0501-02

OBJECTIVES BY UNIT	CONTENT
3. Natural and Controlled forms in landscape plantings	A. Natural and controlled forms within the 4 major classifications of plants
Objective 4 Will on viewing a given landscape understand the intended function of plants in achieving a design objective	B. Plants controlled to achieve special objectives or forms
Objective 5 Will become familiar with natural and controlled forms of various plants	

EDUCATION

PRUNING ORNAMENTALS - Code
01.0501-C2 - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Slides films, field trips to establish landscape sites visit to nurseries, garden centers	A. To recognize the various forms a specific plant may be controlled in order to achieve several different objectives B. To understand the need to prune plants to maintain their natural form or an unnatural form C. To differentiate between desirable or pleasing forms and forms which conflict or are incompatible with the site D. Examples demonstrating various forms plants may be controlled. E. Slides depicting special or specific forms for the same plant for various design objective F. Visit to housing sites demonstrating various forms and sizes G. Visiting nurseries parks institutional planting H. Students can identify various forms observed to achieve specific objectives	A. The student will be able to understand and identify several forms that a given plant can take to achieve various design objectives. Be able to differentiate between natural and controlled forms of plants B. Student will be able to identify undesirable weak and diseased portions of a plant

AGRICULTURAL

Module ___ PRUNING ORNAMENTALS ___ 01.0501-02

OBJECTIVES BY UNIT	CONTENT
4. Use and Maintenance of Pruning Tools Objective 6 The student will be able on visiting a landscape planting to select and effectively use the proper pruning tool for any given purpose Objective 7 Given a set of pruning tools the student will be able to sharpen, adjust and sterilize his tools. In addition he will be acquainted with and demonstrate safe handling and storage of his tools.	A . Pruning tools B . Proper use and selection of tools C . Maintenance and Sanitation of tools D . Tree wound dressing and use E . How and where to cut

01.0501-02 - Code

PRUNING ORNAMENTALS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate proper use and selection of tools	A. Selecting proper tool and its use for a given objective	A. Student will be able to select and effectively use the proper tools for various pruning tasks
B. Disassemble tools for cleaning, sharpening, sterilizing and adjusting	B. How to properly adjust, sharpen and sterilize tools.	B. Student will be able to properly and safely maintain store sharpen and sanitize his tools
C. Using portions or entire plants in laboratory or field demonstrate how and where to cut	C. Trace and dress bark wound	
	D. Remove major limbs with 3 step cut	
	E. Safe handling and storage of tools	
	F. Use of Power Tools	
	G. To make pruning cuts clean and at proper location	
	Lab activities Tools can be demonstrated in lab	
	Tool maintenance and safety procedures can be demonstrated in lab	
	Field Activities Arrange with institution, nursery municipality to allow students to practice and demonstrate skills	

MODULE PRUNING ORNAMENTALS 01.0501-02

OBJECTIVES BY UNIT	CONTENT
5. Timing and Pruning methods	A. When to prune (timing)
Objective 8 On several given situations the student will demonstrate his pruning skills for attaining the 5 given pruning objectives in each of the 4 major classifications	B. Types of pruning for various objectives . Pruning for sanitation and health . " " compacters . " " size control . " " form . " " flower and fruit
Objective 9 Student will be able to remove a major limb, trace and dress a bark wound on a tree	Removal of pruned branches, and thoroughly cleaning up after pruning

PRUNING ORNAMENTALS - Code
01.0501-02 - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Slides Movies	A. Be able to identify and prune out undesirable or diseased wood	A. Student will be able to demonstrate his pruning skills in the 5 major pruning objectives
B. Bulletins	B. Student to effectively demonstrate and understand the 5 types of pruning objectives	B. Student will be able to thoroughly clean and pickup all pruning trimming and leave the landscape in a neat condition
C. Demonstration plots	C. Student to understand the importance of timing	
D. Housing sites	D. Student to be able to effect several types of pruning objectives on a single plant, in any of the major 4 classification (unit 2)	
E. Park Settings	E. Student should have an opportunity to prune several plants in each classification	
F. Institutional Plantings	F. Arrange with local home owners, nurseries or institutions.	
G. Have students demonstrate various types individually or in groups		

MODULE OF INSTRUCTION

Title - PRUNING ORNAMENTALS Code - 01.0501-02

RESOURCE MATERIALS

BOOKS

Fenska, Richard R., Tree Experts Manual, New York A T DeLaMare Co., Inc. 1954 238 pgs $4.50

Pirone P.P. New York Oxford University Press 1959 483 pgs

Hudson, Roy Menlo Park, Calif. Lane Publishing Co 80 pgs. $1.95

Bush-Brown James and Louise, New York Charles Scribner and Sons 1958

Christopher E.P. "The Pruning Manual" MacMillian New York 1954

BULLETINS

Pruning Ornamental Trees and Shrubs, Albany County Agricultural Extension Service, Albany, New York

Pruning Ornamental Shrubs and Vines, USDA Bulletin #165

Pruning Shade Trees and Repairing Their Injuries, USDA #83

Pruning Shrubs: New Jersey Experiment Station
Rutgers University
New Brunswick, New Jersey
Bulletin # 771

MODULE OF INSTRUCTION

Title - FLORAL DESIGN AND CONSTRUCTION Code - 01.0502-01

DESCRIPTION:

Students enrolled in this module will identify the common types of flowers and floral materials used in construction of arrangements and corsages.

The module includes proper methods of caring for cut flowers and foliage after receiving them from floral wholesalers. Selection of storage containers, refrigeration temperature and special treatment for various types of plant material is included.

Each student will develop skills in using the florist knife, scissors, pliers, etc., and materials such as floral tape and floral arrangement holding materials.

Following basic use of hand tools, student will learn to construct vertical crescent, horizontal and similar floral arrangements of basic types with emphasis on the local market for such designs.

In addition, students will construct corsage frames, learn to tie corsage bows and assemble single flower, spray, double spray, and wrist type corsages.

	Time Allocation	
MAJOR DIVISIONS OR UNITS OF CONTENT	Class	Other
1. Identifying and handling floral materials	2	3
2. Basic Corsage Design	3	7
3. Basic Floral Design	4	11
	9	21

Revised June, 1974

MODULE OF INSTRUCTION

Title - FLORAL DESIGN AND CONSTRUCTION

Code - 01.0502-01

OBJECTIVES to be obtained:

The student will be able to:

1. Identify basic flowers and foliage for retail shop situations.
2. The student will develop skill in the care and handling of cut flowers and foliage.
3. Identify and use correctly all tools and equipment necessary for floral designs and corsages.
4. Make bows for corsage work satisfactory to area retail shops or industry.
5. Construct basic corsages including the selection of flowers, color, style, ribbon, wiring, and backing material.
6. Select proper flowers, correct size and style of container, wire weight and proper foliage and fillers to create basic live arrangements that will be acceptable to the standards of the shop or industry for specific purposes.

Module FLORAL DESIGN AND CONSTRUCTION 01.0502-02

OBJECTIVES BY UNIT	CONTENT
1. Identification and handling of floral materials, tools and equipment. Objective 1 . Student will identify all basic flowers, foliage and fillers used by the shop.	A. Cut flowers to be used for floral design and corsage making . Roses . Carnations . Gladiolus . Chrysanthemums . Pom-poms . Fillers i.e. gypsophillie, statice, etc. . Snaps . Stock . Other B. Foliage . Huckleberry . Potocarpus . Salal . Leather leaf . Use of indoor foliage plant i.e. Sansevaria, English Ivy. . Lemon . Cedar . Asparagus fern . Maiden hair fern
Objective 2 . The student will develop skill in the care and handling of cut flowers and foliage.	A. Conditioning of flowers and foliage . Cut stems . Removing excess foliage . Water temperature - 110° . Selection of refrigerator containers . Searing of milky stems . Handling bulbous stems (i.e. daffodils, iris, tulips) . Woody stems (i.e. mums, fruit branches, forsythia) . Use flower of preservatives

EDUCATION

Module FLORAL DESIGN AND CONSTRUCTION 01.0502-02

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Field trip to wholesale house to see materials. B. Demonstration of the materials handling & use. C. Lecture discussion of the identification characteristics.	A. Students will visit wholesale house on field trip. B. Each student will have opportunity to see the flowers and foliage and to handle them to distinguish one from another. C. Notes on identification characteristics.	. Identification test of materials.
Demonstrate process of conditioning flowers Identify milky stems, bulbous stems and wood stems	A. Students will unpack cut flowers. Follow procedure stated for conditioning flowers. B. Students will each prepare a bulbous, stem, woody stem and a milky stem flower for hardening, after having identified what flowers are classified as bulbous, woody and milky. C. Materials will be placed in student notebook for further reference.	Student will properly prepare a box of cut flowers from time of delivery from wholesaler to display cooler for use in floral design under various conditions, to satisfaction of instructor.

Module FLORAL DESIGN AND CONSTRUCTION 01.050 -02

OBJECTIVES BY UNIT	CONTENT
Objective 3 · Identify and use correctly all tools and equipment necessary for floral design and corsages.	A. Tools and equipment . Knife . Scissors (ribbon and wire) . Wire sizes . Flower holders . Use of floral clay . Pliers . Wire cutter . Oasis cutter . Pruner . Floral tapes . Other . Davee or Meyers tape

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate the safe use of each tool and item of equipment.	A. Show use of each of the tools.	A. Student performs to satisfaction of instructor .
B. Film strip	B. Have students use each tool, i.e.knife for cutting flowers and foliage, wire shears, ribbon shears, etc.	B. To recognize each of the tools.
C. Importance of the care of tools.	C. Students will learn wire weights by feel and use with particular flowers. Selection of flower holders will be available to students. They will have the opportunity to use each kind: i.e. pin holders, frogs, needlepoints, shredded styrofoam, oasis, greens, and chicken wire and other trade materials used as holders.	C. To know how each of the tools should be handled from a utilitarian point, as well as a safety standpoint.
D. Identification of wire size and use.	D. Floral clay will be available and students will work with it, softening, rolling it, then placing it on the pin holders, and adhere it to container to show its value to floral designer.	D. To distinguish wire weights.
	E. Other floral adhesives and devices used in the trade will be available for student use.	

Module FLORAL DESIGN AND CONSTRUCTION 01.0502-02

OBJECTIVES BY UNIT	CONTENT
2. Basic Corsage construction Objective 4 . Students will make bows, for corsages satisfactory to shop standard or industry.	A. Making corsage bow . Standard . Variations B. Making maline tuffs . Bunched . Fan . Butterfly C. Make corsage frames
Objective 5 . Construct basic corsages including the selection of flowers, color, style, ribbon, wiring and backing material.	A. Steps for corsage construction . Select magerial . Wire flowers and greens (if used) . Tape flower and wire . Assemble materials . Attach bow B. Corsages for construction . Single flower . Double flower or more . Double spray . Wrist corsage variations

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration of correct technique used in standard shop and variations that may be used by shops in the area for each of the items. B. Discussion of purpose for each part of support for the corsage.	A. Have students make corsage bows following specific guidelines. (It is easier for students to learn to make a bow if you as instructor make one along with them, explaining each step.) B. Students practice making bows, etc. first in a copy form and then individually to gain dexterity.	Students make bows etc., to the satisfaction of industry and area shops.
A. Demonstrate correct technique to follow for the construction of the basic corsage. B. Discussion of selection of materials to use before beginning as to color, style, flowers, backing material, to meet the situation. C. Several prepared corsages of living flowers for observation. D. Flip chart or overhead projections.	A. Have students wire and tape various flowers. Each type of wiring method will be experienced. Wiring to be followed by taping the stems. B. Have student wire foliage. C. Students will assemble basic corsage - spray structure method - followed by double spray, etc. - will incorporate skills in wiring, taping, bow making, maline and placement of flowers. D. Evaluation by students and of finished products.	A. Step by step individual evaluation to instructor's satisfaction for wiring of flower, wiring foliage. B. Construction of corsage by type to satisfaction of instructor.

Module FLORAL DESIGN AND CONSTRUCTION 01.0502-02

OBJECTIVES BY UNIT	CONTENT
3 . Basic Floral design Objective 6 Select proper flowers, correct size and style of container, wire weight and proper foliage and fillers to create basic live arrangement that will be acceptable to the standards of the shop or industry for specific purposes.	A. Container selection . Purpose for use . home . hospital . others . Selection . shape . decoration . style . Holding materials . flowers . devices to contain holding material A. Types of arrangements . Mass arrangements . Line arrangements . Mass-line arrangements B. Identifying line arrangements . "L" shape . Vertical . Crescent . Horizontal . Triangle or 3 line . Fan . Hogarth or S Curve C. Wiring techniques

01.0502-02 - Code

FLORAL DESIGN AND CONSTRUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Discussion of containers through demonstration of various types based on materials and location. B. Slides, pictures, overheads, opaque projections of various types of containers and holding materials. C. Supervised study - Fox's - Guide To Flower Arranging. D. Review of holding materials from objective #2. E. Stress important limitations found with each type of material used for holding purposes.	A. Examination of various containers and materials. B. Student identification and practice in mounting various holding devices.	A. Demonstrate to satisfaction of instructor that student can select a container and holding materials for a given situation.
F. Film Strip - "Flower Arranging - Beginning Techniques G. Slides H. Pictures I. Mimeographed and enlarged sketches of arrangements for each student to have J. Explain difference between types of arrangements K. Demonstration of triangle arrangement by teacher, identifying each procedure to students L. Demonstration of other line arrangements M. Artificial arrangements made up in advance for students to study. N. Wire demonstration and techniques O. Field trip retail shop. P. Students will not work using permanent flowers at this time.	C. Students will begin their basic floral design with the triangle line selection of flowers, foliage and container. D. Trip to retail flower shop. E. Previous arrangements have been made so students can identify floral design techniques as they are being done. F. Have students progress from one type of arrangement to another evaluating as they go along. Compare a triangle arrangement to a "L" shape arrangement. Decide which style arrangement will be best suited for specific areas.	B. Student will construct to instructor's satisfaction a simple home arrangement using each of the three recognized types of arrangements.

OBJECTIVES BY UNIT	**CONTENT**
3. - Continued	D. Arrangements - specifics . Bowl of sweetheart roses . Vase of roses . Hospital piece for a price . Simple home arrangement for a price . Standard shop piece for a shop in the most basic design . Simple novelty - for child or youth as a party . Standard FTD arrangement at the lower price range. E. Shop housekeeping . Care of materials . Cleaning up work counters and area.

EDUCATION

Module FLORAL DESIGN AND CONSTRUCTION 01.0502-02

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Demonstrate the construction of each of the arrangements.	A. Student construction of all these pieces keeping in mind that this type of work is done with a time factor in mind as a worker - and that the work must be acceptable to the public for the price.	A. Students will construct, using the materials available, each of the specified arrangements.
B. Field trip to a retail shop to see actual work in progress.	B. Arrangements except roses will show ability in materials selected, color, harmony, texture line, style, and focal point.	B. Student will be judged on - selection of materials design work - acceptability length of time to perform the work
C. Pictures from trade magazines		C. All work must be to the standard of the industry and shops of the area. Evaluation then would be by a retail florist or designer of the area.
D. Guest floral designer.		

MODULE OF INSTRUCTION

Title - FLORAL DESIGN AND CONSTRUCTION Code - 01.0502-02

RESOURCE MATERIALS

A. Books - Moore, Stanley B. - Ornamental Horticulture as a Vocation, Fairborn, Ohio 1969

Fox, Raymond T. - A Teacher's Guide to Flower Arrangement - Kenneth Post Foundation NYS College of Agriculture, Cornell University, 1960, Ithaca, New York

Krupinski, Doris Ann. Design Guidelines

B. Bulletins - Floral Design Pointers - Flora Tape
Marathon, Div. of American Can Co., Neenah, Wis.

C. Periodicals -

"Florist" - FTD Publication - Monthly $8 per year

D. Audiovisuals -

Vocational-Education Productions - 1968-1969

Flowers to Wear - California State Polytechnic College

Flower Arranging - California State Polytechnic College

Beginning Techniques - -California State Polytechnic College

Careers in Ornamental Horticulture - California State Polytechnic College

MODULE OF INSTRUCTION

Title - FUNERAL SPRAY & WREATH CONSTRUCTION **Code -** 01.0502-02

DESCRIPTION:

The student will be able to identify, wire and pick flowers for funeral work; as well as cut styrofoam to form a spray bar. Also included will be the identification of greens and greening a spray bar.

The module contains the placement of flowers, and the use of a bow or a banded bow in a spray and wreath.

The selection of the proper card, as well as filling in card and envelope, is found within this module. Student will also make use of ribbon in funeral spray work.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	 Other
1. Identifying flowers and materials	2	2
2. Sprays	2	10
3. Wreaths	3	11
	7	23

Revised June, 1974

MODULE OF INSTRUCTION

Title - FUNERAL SPRAY & WREATH CONSTRUCTION
Code - 01.0502-02

OBJECTIVES to be obtained:

The student will be able to:

1. Identify various flowers used in funeral work.
2. Cut styrofoam for a spray bar.
3. Place greens in a spray bar base.
4. Attach wood and aqua picks to flowers.
5. Place flowers in spray according to minimal acceptable trade level.
6. Arrange greens in a funeral wreath
7. Band a number 40 ribbon into a bow for a funeral wreath.
8. Place flowers such as gladiolus and carnation in a funeral wreath.
9. Letter cards and attach to arrangement as requested by purchaser..

01.0502-02

Title - FUNERAL SPRAY AND WREATH CONSTRUCTION

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identifying flowers and material Objective #1 The student will identify various flowers used in funeral work.	A. Gladiola B. Carnation C. Standard mums D. Pompoms E. Roses F. Orchids
Objective #2 The student will cut styrofoam for a spray bar.	A. 12" X 2" X 36" styrofoam, block (green in color) B. Knife C. Ruler
Unit 2 - Sprays Objective #3 The student will green a spray bar base.	A. Greens . Cedar . Laurel . Lemon . Huckleberry . Maiden Hair fern . Other B. Spray bar 12" X 5" X 2" C. Serrated shears

Module FUNERAL SPRAY & WREATH CONSTRUCTION 01.0502-02

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
Showing the students the flowers and discussing the holding value and costs of each.	Each student to see, touch, smell the varieties and make notes as to their findings.	The student will be able to identify the flowers when given to them without notes.
Measure and mark styrofoam to cut a spray bar 12"x6"x2" hold knife in right hand, styrofoam down with left. Cut to 3/4 depth of styrofoam Move styrofoam to edge of table so cut is overhanging and apply pressure and snap off - it will break clean. Safety: Using cutting knife with care.	Each student to cut 3 spray bars and note instructor's safety using a knife.	The student will be able to cut a spray bar to correct size and using correct tool to produce a clean cut.
Lay styrofoam bar 12"x6"x2" on work table. Dimensions will be 3 1/3'x2 1/2'. Cedar greens to be put around entire block to give extension - it is stuck directly into styrofoam. Laurel is broken into shorter pieces and stuck into styrofoam to fill center - if a lace look is wanted; maiden hair fern can be added over the top (but stuck into styrofoam).	Each student will make notes of dimension and various materials and prepare a spray bar with greens.	The student will be able to select a variety of greens and form a spray bar to correct dimensions required by instructor.

Title - **FUNERAL SPRAY AND WREATH CONSTRUCTION**

OBJECTIVES BY UNIT	CONTENT
Objective #4 The student will be able to attach wood and aqua picks to flowers.	A. Wood picks . 8" . #23-18" wire . Serrated shear. . Carnation . Gladiola B. Aqua pick . #23-18" wire . Serrated shear . Carnation

EDUCATION 01.0502-02 - Code

FUNERAL SPRAY AND WREATH CONSTRUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration: cut glad. off 2" below last florette - Take pick in right hand with point down - shove blunt end up into flower stem and wrap with #23 wire.	A. Each student to wire three glads and three carnations. Make notes as to method, wire and pick size.	A. The student will be able to select materials needed and wire a glad and carnation on a wood pick.
B. Carnation - cut with 4" stem #23 - 18" wire through calyx and down leaving one side longer, put pick along side of stem and with long end of wire wrap it.	B. Each student to wire and place three carnations in aqua pick and make notes of other flowers.	B. The student will be able to aqua pick flowers correctly and select flowers for aqua picks.
C. Demonstration: cut carnation with 6" to 7" stem - #23 wire through calyx and wrap down cut excess wire off - place in aqua pick - Discussion of other flowers.		

Title - FUNERAL SPRAY AND WREATH CONSTRUCTION

OBJECTIVES BY UNIT	CONTENT
Objective #5 The student will place flowers in a spray bar.	A. 12 gladiolas B. 12 carnations C. #40 ribbon D. Scissors E. 8" wood picks F. Aqua picks G. #23 - 18" wire H. Serrated shear I. Green spray bar
Unit 3 - Wreaths Objective #6 The student will be able to green a funeral wreath.	A. Huckleberry B. Laurel C. Styrofoam wreath D. Serrated shears

EDUCATION

Module FUNERAL SPRAY & WREATH CONSTRUCTION 01.0505-02

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Picture - Demonstration - place 5 gladiolas out at top - all points show. Place 3 out the bottom - place 2 on each side. B. Place bow made of #40 ribbon and have streamers in center toward bottom. Place the 12 carnations above bow and 2-3 through bow loops.	Each student to make a funeral spray with 12 gladiolas and 12 carnations and complete.	The student will be able, given 12 carnations and 12 glads, to complete a funeral spray bar to specifications of the instructor
A. Demonstration (picture) - Lay on table and cut greens and insert into styrofoam to extend 4"-5" to outside and 2" to inside. Work in a clockwise fashion until finished. B. Mix huckleberry and laurel C. Discussion of other greens	Each student will green a wreath and note the various other greens that can be used.	The student will be able to green a wreath correctly to satisfaction of instructor - and may be asked to use various materials.

Title - FUNERAL SPRAY AND WREATH CONSTRUCTION

OBJECTIVES BY UNIT	CONTENT
Objective #7 The student will be able to band a bow for a wreath.	A. #40 ribbon B. #23 - 18" wire C. 8" picks D. Scissors E. Greened wreath
Objective #8 The student will be able to place flowers such as gladiolas and carnations in a funeral wreath.	A. Greened wreath B. #23 - 18" wire C. 36 gladiolas D. 12 carnations E. 8 picks F. Aqua picks G. Serrated shears H. Banded bow

Module FUNERAL SPRAY & WREATH CONSTRUCTION 01.0502-02

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
Demonstration - Make a bow with #40 ribbon - do not cut from roll - extend out on the attached piece about 2'-2 1/2' and make another bow. Leave several tails coming out of second bow. Cut from roll and attach each bow to a pick (same as picking a flower) place bow without tails near top left and bow with tails near bottom right - Band goes across center of wreath.	Each student to make a banded bow, making sure to follow the demo. of the instructor.	The student will be able to make a banded bow given a roll of #40 ribbon.
Picture - Demonstration: Place glads. in a clockwise motion from top bow to bottom bow - place 3 flowers out of top - place glads in through bow loop and a little to the left of bottom bow from top bow to where glads finish put the 12 carnations.	Each student will place flowers in the wreath, keeping form and appearance as suggested in teaching method.	The student will be able to make a wreath given material to satisfaction of instructor.

Title - **FUNERAL SPRAY AND WREATH CONSTRUCTION**

OBJECTIVES BY UNIT	CONTENT
Objective #9 The student will be able to attach a card and lettering.	A. Completed wreath B. Lettering C. Card D. Pin E. Pen F. Stapler (ace)

Module FUNERAL SPRAY & WREATH CONSTRUCTION 01.0502-02

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
Write out the card according to customer request. Make sure it is a sympathy card. Write out the envelope - address to the deceased and funeral home. With a pin attach envelope with card inside to a loop in ribbon. Lettering (mother, father, son, loved one, husband, wife, sympathy, friend, rest in peace) place across the band in bow. Take ace stapler and staple it on in several places.	Each student to practice writing card and envelope, take notes on lettering being attached.	The student will be able to properly fill out a card and envelope and put lettering on a funeral piece to satisfaction of customer.

MODULE OF INSTRUCTION

Title - FUNERAL SPRAY AND WREATH CONSTRUCTION Code - 01.0502-02

RESOURCE MATERIALS

A. Books - John Henry Color and Work Book. Donald Herbert, Box 413, R.D. #2 Highland, New York 12528

- Conway's Treasury of Flower Arrangements, Conway, Gregory J. and Knopf, Alfred A., New York 1955
- FTD Floral Selection Guide - 1974, Florists' Transworld Delivery Association, Detroit, Michigan.
- Modern Florist Designing, Soules, Ken, Florists' Publishing Company, Chicago, Illinois 1957.

MODULE OF INSTRUCTION

Title - FUNERAL DESIGNS Code - 01.0502-03

DESCRIPTION:

Student will be involved in making basic form for casket covers using live floral materials.

Also student will construct special cross, heart, pillow, and rosary floral arrangements.

Methods of pricing funeral arrangements according to local conditions are included in the module.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Basic Casket Covers	3	7
2. Funeral Tribute Construction	5	15
	8	22

Revised June, 1974

MODULE OF INSTRUCTION

Title - FUNERAL DESIGNS **Code - 01.0502-03**

OBJECTIVES to be obtained:

The student will be able to:

1. Identify casket cover bases.
2. Properly drape a casket cover base
3. Place the flowers in a casket cover
4. Construct a cross to industry standards*
5. Construct a heart to industry standards*
6. Construct a pillow to industry standards*
7. Construct a rosary to industry standards*
8. Determine selling prices of funeral work.

* Note, industry standards incorporate selection of flowers, proper base, tools, materials, proper wiring, and time. Proper flowers, tools, materials and wiring methods in module 01.0502-02

AGRICULTURAL

Module FUNERAL DESIGNS 01.0502-03

OBJECTIVES BY UNIT	CONTENT
1. Basic Casket Forms	
Objective 1 . The student will be able to identify casket cover bases. A. styrofoam and legs B. saddle	A. Materials . Styrofoam . Casket cover legs . Casket saddle . 24"x4"x1 1/2" container . Oasis - fill fast . Meyer or Davee tape . #23 - 17" wire B. Tools . Serrated shear
Objective 2 . The student will be able to properly drape a casket cover base.	A. Use of greens . Maiden hair fern . Huckleberry . Laurel B. Tools Serrated shear C. Material Casket cover base.

Module FUNERAL DESIGNS 01.0502-03

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Cut a piece of styrofoam (green) 30"x6"x2" and insert casket cover legs into piece and stand. B. Casket saddle - cut piece of styrofoam to fit saddle - cut a depression into styrofoam to fit container 24"x4"x1 1/2" (that has been prepared with oasis or fill fast), and wire all together to form a single unit.	Each student to prepare each casket covering method.	The student will be able to set up a casket cover base to the requirements of industry.
C. Demonstration - using long pieces of maiden hair fern - insert into styrofoam around casket cover base - (work on a small table so greens will hang down). Mix in huckleberry to give a heavier look - the base top is filled with laurel - same as in Module 01.0502-02 objective III.	Each student to drape a casket cover base with greens.	The student will be able to drape a casket cover using assorted greens in a given time set by instructor, to the requirements of industry.

OBJECTIVES BY UNIT	CONTENT
1. - Continued	
Objective 3 . The student will be able to place the flowers in a casket cover base.	A. Flowers . Gladiolas (30) . Carnations (30) . Standard mums (12) B. Tools . Serrated shears . Scissors C. Materials . 8" picks . Aqua picks . #23 - 18" wire . Ribbon #40 . Casket cover base greened

Module FUNERAL DESIGNS 01.0502-03

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Demonstration: Flower selection module 01.0502-02, objective #I. The preparation of flowers to picks Module 01.0502-02, objective #IV. B. The banded bow module 01.0502-02, objective VII - place the banded bow in the top of the casket cover base with the tails coming down right side when facing it. Place gladiolas in so as to have going in a downward flow and continue to work up toward center. Some carnations and mums will be wired with longer stems and placed among glads in a draping effect also. The short wired carnations and mums will be placed in and around bow loops. The card and lettering will be attached as module 01.0502-02, objective IX.	Each student to make a casket cover with flowers and bow and card and lettering.	The student will be able to make a casket cover; given 30 gladiolas, 30 carnations, and 1 doz. mums; to a completed piece satisfactory to instructor and the industry.

OBJECTIVES BY UNIT	CONTENT
2. Funeral Tribute Construction Objective 4 . The student will be able to construct a cross to industry standards.	A. Flowers . Gladiolas (36) . Roses (12) B. Tools . Serrated shears . Scissors C. Materials 1. 8" picks 2. Aqua picks 3. #23 - 18" wire 4. Ribbon #40 5. Styrofoam cross D. Greens 1. Huckleberry 2. Laurel

01.0502-03 - Code

FUNERAL DESIGNS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration - Green the cross same as a wreath module 01.0502-2, objective VI - facing the cross place a single bow with streamers in the right bottom corner of where the cross is formed. Gladiolas are worked from the outside to center and from top and bottom to center on each cross member. The 12 roses are placed as are carnations in aqua picks and placed in and around bow loops - The card, and lettering (if it is needed) are attached (lettering to one of the tails).	Each student to make a cross with gladiolas and roses and greens.	The student will be able to make a cross, with greens, flowers, ribbon, to industry standards.

Module FUNERAL DESIGNS 01.0502-03

OBJECTIVES BY UNIT	**CONTENT**
2. - Continued	
Objective 5 . The student will be able to construct a heart to industry standards.	A. Flowers . 60 white carnations . 12 red roses B. Tools . Serrated shears . Scissors C. Materials . Aqua picks . #23 - 18" wire . Ribbon #40 . Styrofoam heart D. Greens . Huckleberry . Laurel
Objective 6 . The student will be able to construct a pillow to industry standards.	A. Flowers . 60 carnations . 3 orchids B. Tools . Serrated shears . Scissors C. Materials . Aqua picks . #23 - 18" wire . Ribbon #40 . Styrofoam pillow D. Greens . Huckleberry . Laurel

EDUCATION

Module FUNERAL DESIGNS 01.0502-03

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
Demonstration: Green the heart at edge same as module 01.0502-02, objective VI and center as in module 01.0502-02, objective III. Bow is placed to right and a little below center and has tails. The carnations are placed all around following heart shape and worked into center. The roses are placed in and around bow loops with about 3 shooting down like the tails of the bow. The card and lettering (if it is needed) are attached (lettering to one of the tails).	Each student to make a heart with the carnations, roses and greens.	The student will be able to make a heart, with carnations, roses, ribbon, greens to industry standards.
Demonstration:- After greening to form, wiring flowers and banding bow, place bow without tails at upper left side and bow with tails by bottom right - banding on a diagonal. Place the carnations to shape of styrofoam and build in curve of a pillow shape. Place the 3 orchids in the bow loops.	Each student to make a pillow with carnations, roses and greens.	The student will be able to make a pillow, with carnations, orchids, ribbon and greens to industry standards.

OBJECTIVES BY UNIT	CONTENT
2. - Continued	
Objective 7 . The student will be able to construct a rosary to industry standards.	A. Flowers . 60 roses B. Greens . Maiden hair fern C. Tools . Serrated shears . Scissors . Pliers D. Material . Florist "Rosary" . #23 - 18" wire . Ribbon #3
Objective 8 . The student will be able to determine selling prices of funeral work.	Local flower shop Retail price list

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
Demonstration - The rosary has 60 clips to hold the calyx of the roses - Take small 3"-4" long pieces of maiden hair fern and put rose and fern together into clip and squeeze together with pliers. Do this for 60 roses. Attach small bow at intersection of circle and tail of the rosary.	Each student to make a rosary with roses and maiden hair fern.	The student will be able to make a rosary in 1 1/2 hours time with 60 roses, fern and ribbon to industry standards.
Discussion: Depending on area and shop, flowers are sold at different rates per dozen. • The casket cover would be from $55 to $100 • The cross would be from $30 to $60 • The heart would be from $40 to $70 • The pillow would be from $30 to $60 • The rosary would be from $45 up. • The costs are based on flower per dozen and then greens must be added above that.	The students to make notes of items discussed.	The student will be able to price a funeral piece.

MODULE OF INSTRUCTION

Title - FUNERAL DESIGNS

Code - 01.0502-03

RESOURCE MATERIALS

Books - John Henry Book

Source:
Mr. Donald Herbert
Box 413
R.D.# L
Highland, N.Y. 12528

Bulletins -

Tele-flora Bulletins

F.T.D. Bulletins - Floral Selection Guide - 1974. Florist Transworld Delivery Association, Detroit, Michigan

MODULE OF INSTRUCTION

Title - SIMPLE WEDDING DESIGNS Code - 01.0502-04

DESCRIPTION:

The student will be able to identify various flowers such as stephenodis, roses, orchids, daisies, carnations, pompons; to construct wedding design of nosegay, simple cascade, colonial and prayer book bouquets.

Correct methods of wiring and care of the flowers; as well as taping use of greens and nettings is included. The experience of finishing off the bouquet with a bow or bow and streamers and care of bouquet before delivery is provided students.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Identifying Flowers and Greens	2	2
2. Conditioning Flowers	1	1
3. Wiring and Taping	1	2
4. Construction	4	19
	8	24

Revised June, 1974

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MODULE OF INSTRUCTION

Title - SIMPLE WEDDING DESIGNS Code - 01.0502-04

OBJECTIVES to be obtained:
The student will be able to:

1. Identify the six following flowers: **stephenodis** , roses, orchids, daisy, carnations, and pompons, on a written or oral test by writing their names after observing them.

2. Identify the three following greens, maiden hair fern, camellia leaves, and ivy, on a written or oral test by writing their names after observing them.

3. Condition flowers in class following the six steps necessary to properly condition flowers.

4. Wire properly, to the instructor's satisfaction, the following greens, maiden hair fern, camellia leaves, and ivy.

5. In class, using correct methods, wire and tape, to trade standards, the following flowers, **stephenodis**, roses, orchids, daisies, carnations, and pompons.

6. In class correctly construct, to trade standards, bouquets of;

   A. Nosegay
   B. Simple cascade
   C. Colonial
   D. Prayer book

01.0502-04

Title - **SIMPLE WEDDING DESIGNS**

OBJECTIVES BY UNIT	CONTENT
1. Identifying Flowers and Greens Objective 1 The student will identify the six following flowers, stephnodis, roses, orchids, daisies, carnations, and pompons, on a written or oral test by writing their names after observing them.	A. Roses B. Orchids (cattleya, cymbidium and phalenopsis) C. Daisies D. Carnations E. Pompons F. Stephenodis
Objective 2 The student will identify the three following greens, maiden hair fern, camellia leaves, and ivy, on a written or oral test by writing their names after observing them.	A. Maiden hair fern B. Camellia leaves C. Ivy
2. Conditioning Flowers Objective 3 The student will condition flowers in class following the six steps necessary to properly condition flowers	A. Cut flower stems B. In some cases flower stems exude a milky substance which plugs their water conducting tissue. To prevent this char the end of the stem in a flame. C. Remove excess foliage D. Add commercial flower food to water at 110°F. Place flowers in water E. Wrap a piece of plastic around flowers while they are in warm water F. Refrigerate flowers (above taken from "Add Hours To Your Flowers". NYS Extension Bulletin 1192 Your Flowers. R. T. Fox and J. W. Boodley)

01.0502-04 - Code

SIMPLE WEDDING DESIGNS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Hold up each flower for students to see and write name of flower on board. B. Place flowers in refrigerator for further student observation.	Students shall take notes	Written or oral test
A. Hold up each type of greens for student to see and write name of greens on board B. Place greens in refrigerator for further student observation	Students shall take notes	Written or oral test
A. Hand out ditto listing six steps B. Teacher demonstration	A. Students shall take notes B. Students shall condition flowers	Student performance

Title - SIMPLE WEDDING DESIGNS

OBJECTIVES BY UNIT	CONTENT
3. Wiring and Taping Objective 4 The student will wire properly, to trade standards, the following greens, maiden hair fern, camellia leaves, and ivy.	Wiring A. Maiden hair fern Serrated shears #23 - 18" wire Floral tape B. Camellia leaves Serrated shears #23 - 18" wire #30 - 18" wire Floral tape C. Ivy #23 - 18" wire Floral tape Serrated shears

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration - Cut a piece of maiden hair fern 4" long, cut 18" wire in half - place one wire along stem of maiden hair fern and tape together	A. Each student to wire 3 pieces of maiden hair fern.	A. Student's performance in wiring B. Quality of finished product
B. Demonstration - Cut #23, 18" wire in half, take a full piece of #30 wire and put through the leaf 1/2" up from pedicle and on either side of midrib. Take the 1/2 piece of #23 wire and lay up under bend in #30 wire on back where bend is located. Tape all together, leaf is on artificial stem.	B. Each student to wire three camellia leaves.	
C. Demonstration - Cut ivy leaf with short stem from plant. Cut #23, 18" wire in half and tape both pieces to ivy stem, keeping wire right up to leaf base.	C. Each student to wire three ivy leaves	

Title - SIMPLE WEDDING DESIGNS

OBJECTIVES BY UNIT	CONTENT
Objective 5 Each student shall in class, using correct methods, wire and tape, to trade standards, the following flowers: stephnodis, roses, orchids, **daisies**, carnations, and pom-pons.	A. Roses . #23 18" wire . Serrated shears . Floral tape
	B. Orchids (cattleya) . #23 - 18" wire . Floral tape . Serrated shears . Wet paper towel
	C. **Daisies** . #23 - 18" wire . Serrated shears . Floral tape . Wet paper towel
	D. Carnations . #23 - 18" wire . Serrated shears . Floral tape
	E. Pom-pons . #23 - 18" wire . Serrated shears . Floral tape
	F. **Stephenodis** . #23 - 18" wire . Serrated shears . Wet cotton . Floral tape

01.0502-04 - Code

SIMPLE WEDDING DESIGNS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstration - The rose head will be cut with a 1" stem. A full length of wire will be placed through the calyx and bent down. A 1/2 piece of wire will be inserted up through the calyx, and all three wires are taped from calyx down.	A. Students to wire 3 roses each	A. Student performance B. Quality of finished product
B. Demonstration - Cut 1/4" orchid stem off. Wrap stem with wet paper towel and make sure it covers new cut. Take full piece of wire and tape alone, bend in half and where curve is bend back, fit around orchid stem and take another full wire and wrap. Last is to tape with floral tape.	B. Each student will wire an orchid	
C. Demonstration - Cut daisy with a stem of 1 1/2", wrap with wet paper towel. Cut 18" wire in half insert two wires up into calyx to just before they come through center of daisy. Wrap the stem with floral tape.	C. Each student will wire three daisies.	
D. Demonstration - Cut carnation stem to 1 1/2" long, take 18" wire and put through calyx and bend over to form stem. Wrap with floral tape.	D. Each student to wire three carnations	
E. Demonstration - Exactly the same as a daisy only no wet paper towel.	E. Each student to wire three pon-poms	
F. Demonstration - Taking a piece of #23 wire and taping the tip about 1/2 inch; bend it over to form a hook. End of wire not taped is put down through flower and before hook goes down in flower cut a piece of wet cotton into flower, this will keep flower moist. The base of flower is then taped and wired down.		

Title - SIMPLE WEDDING DESIGNS

OBJECTIVES BY UNIT	CONTENT
4. Construction Objective 6 Each student in class shall correctly construct to the instructor's satisfaction, bouquets of: A. Nosegay B. Simple cascade C. Colonial D. Prayer book	A. Nosegay . 3 roses . 5 daisies . 5" collar . #2 ribbon . Scissors . Floral tape . #23 - 18" wire . Serrated shears . Maiden hair fern
	B. Simple cascade . 24 roses . Ivy . #3 ribbon . Scissors . Serrated shears . #23 - 18" wire

01.0502-04 - Code

SIMPLE WEDDING DESIGNS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Demonstration - Picture - John Henry Book with roses, daisies and fern wired, place 3 roses together and tape into one cluster. Place 3 pieces of maiden fern next to them so just the tips of the fern show and tape. Place 5 daisies around the fern and roses just so top of daisy is 3/4 way down rose head and tape. Place 6 pieces of maiden hair fern outside but close to daisies and tape. Place 5" color up around all and tape. Make a bow with streamers and tape on outside collar and tape all wire.	A. Each student to make a nosegay bouquet	A. Student performance B. Quality of finished product
Picture - John Henry Book. Demonstration - With roses and ivy wired, place 2 ivy leaves 1 above the other and then a rose followed by another ivy leaf and a rose slightly to one side, another rose a little above and to other side, alternate ivy leaves and roses until complete. Right next to rose and ivy leaf next to that. Then form **nucleus** of bouquet with ivy mix, attaching a bow without streamers	B. Each student to make a simple cascade bouquet.	A. Student performance B. Quality of finished product

Title - SIMPLE WEDDING DESIGNS

OBJECTIVES BY UNIT	CONTENT
	C. Colonial . 5 carnations . 15 roses . Maiden hair fern . #2 ribbon . Scissors . Serrated shears . Camellia leaves . #23 - 18" wire . #30 - 18" wire . Floral tape
	D. Prayer Book . 1 orchid . 20 stephenodis . Maiden hair fern . #23 - 18" wire . #3 ribbon . Scissors . Serrated shears . Floral tape

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Demonstration - Picture John Henry Book. With all flowers and greens wired from center, 3 roses together placing tips of maiden hair fern around (same as in nosegay) place 5 carnations around and a little below, and the 12 roses around the outside of the carnations. The camellia leaves go all around outside with about 3/4" of leaf out beyond rose head, collar is attached to a bow with streamers.	C. Each student to make a colonial cascade bouquet.	A. Student performance B. Quality of finished product
Demonstration - Picture - John Henry Book - Form two short cascade with stephnodis and maiden hair fern. Place on either side of orchid to a quarter moon or crescent shape. Place additional stephenodis with fern all around orchid and attach together. Attach a bow and bend handle to fit around bound end of prayer book. Take ribbon and go through bouquet over top and bottom end of book and tie.	D. Each student to make a prayer book bouquet.	A. Student performance B. Quality of finished product

MODULE OF INSTRUCTION

Title - SIMPLE WEDDING DESIGNS Code - 01.0502-04

RESOURCE MATERIALS

Books - John Henry Floral Design Book
(color book and work book)
Source: Mr. Donald Herbert
Box 413
R.D. #2
Highland, New York 12528

Bulletins - Floral Tape Bulletin

Add Hours to Your Flowers. Cornell Extension Bulletin 1192

FTD Floral Selection Guide - 1974 - Florists Transworld Delivery Association; Detroit, Michigan.

MODULE OF INSTRUCTION

Title - PRODUCING CHRISTMAS DECORATIONS

Code - 01.0502-05

DESCRIPTION:

The student will select various types of holiday greens, used in assembling wreaths, grave sprays, crosses, swags and garland.

Skills will be developed in producing the above pieces on correct frame or base.

The identification of Christmas plants, how to dress each, wrap for delivery will also be included.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Identification of materials and frames	6	2
2. Construction		15
3. Potted plants	2	5
	8	22

Revised August 75

MODULE OF INSTRUCTION

Title - PRODUCING CHRISTMAS DECORATIONS

Code - 01.0502-05

OBJECTIVES to be obtained:

The student will be able to:

1. Identify holiday greens and know their needle holding values and uses.
2. Demonstrate the use of various base frames and materials used in holiday decorations.

    A. Wreath Frames
        - Single wire ring
        - Hillman ring
        - Styrofoam ring

    B. Grave Sprays
        - Styrofoam base
        - Wood and hay base
        - Chicken wire base

    C. Crosses
        - Styrofoam base
        - Lathe nailed together

    D. Door swag

    E. Garland
        - Rope base
        - Wire base

3. Construct a wreath, grave spray, cross, door swag and garland.
4. Identify, dress, and wrap a potted Christmas plant for delivery.

Code - 01.0502-05

Title - PRODUCING CHRISTMAS DECORATIONS

OBJECTIVES BY UNIT	**CONTENT**
Unit 1 - Identification of materials and frames Objective 1 Student will identify holiday greens and know their holding value	A. Identifying greens . Balsam . Spruce . Pine . Laurel . Holly . Hemlock . Mistletoe . Princess pine
Objective 2 Student will demonstrate the use and various base frames and materials used in holiday decorations	A. Wreath Frames . Single wire ring . Hillman ring . Styrofoam ring B. Grave Spray . Styrofoam base . Wood and hay base . Chicken wire base C. Cross . Styrofoam base . Lathe nailed together D. Door Swag E. Garland . Rope base . Wire base F. Materials and tools . #23 gauge spool wire . #23 gauge 18" cut wire . 4", 6", 8" wood picks . Steel pick machine . Serrated shears . Scissors . Knife . Cones . Ribbon . satin . plastic . Novelties

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Specimen pieces of greens shown to each student -- pieces of each will be left in a warm area, in a floral refrigerator, and in outside cold	A. Student will feel, smell, note the type of needle, leaf	A. Student to identify various pieces of greens shown by instructor
B. The holding value will be shown and determination of most suitable greens for application is made	B. Student will note what greens dry up and which hold well and note results	B. Student will be able to tell what will happen to various greens under certain conditions
A. Demonstrate the use of each frame used for wreaths and what will be the one used specifically in class	A. Student will note types of frames and how to use them	A. Student will have participated in demonstrations and be able to wire: . Wreaths . Grave sprays . Door swags
B. Demonstrate the use of each base used for grave spray. The quality of each and what will specifically be used in class	B. Student will note types of bases and how to use them	B. Crosses Garland in all methods shown
C. Demonstrate the use of the bases and what one will specifically be used in class	C. Student will note bases and how to use them	
D. Demonstrate the attaching of several greens for a door swag	D. Student will use material to attach greens	
E. Demonstrate the base pieces used to make garland and show the pliability of each--rope is easier to bend	E. Student will prepare a garland	
F. Show all tools and materials used to prepare pieces and safety in using each	F. Student will use all tools and materials and note when each is used and safety with use of each	

Code - 01.0502-05

Title - PRODUCING CHRISTMAS DECORATIONS

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Construction Objective 3 Student will construct a wreath	A. Materials needed: . Single wire (8", 10", 12") ring . Balsam greens . #23 gauge spool wire . Serrated shears . Cones . Ribbon . Scissors
Construction of a grave spray	. Styrofoam . 6" wood picks . Serrated shears . Ribbon . Scissors . Cones
Construction of a cross	. Lathe . Nails . Hammer . Saw . Balsam . #23 spool wire . Cones . Ribbon . Serrated shears . Scissors
Construction of a door swag	. Balsam and pine . #23 18" wire . Serrated shears . Ribbon . Cones
Construction of garland (roping)	. Pine . Laurel . Rope . #23 spool wire . Serrated shears

EDUCATION

01.0502-05 - Code

PRODUCING CHRISTMAS DECORATIONS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Help students get started and individual instruction on the hand wiring of a wreath	A. Each student to hand wire a wreath. Start with attaching wire to frame, attaching clump of green and wire over top and through center and repeat to end and sew closed	A. Student will be able to hand wire a 10" wreath in 1½ hours time suitable to what industry requires
B. Help students by individual instruction make a grave spray	B. Each student to make a grave spray on styrofoam base, putting greens into base and completing form to specific length	B. Student will be able to make a grave spray to 6" lengh X 3" width in 1 hours time
C. Help students by individual instruction in construction of a cross	C. Each student to make a cross on a lathe base, making the base and starting on each outside bar and work to center; finish center with cluster of cones	C. Student will be able to make a cross 2' X 3½' and complete with greens in 1½ hours time suitable for industry
D. Help students by individual instruction to make a door swag	D. Each student to make a door swag with 2 balsam branches and 3 pine branches and wire together at top to hang straight and relatively flat	D. Student will be able to make a 3' long door swag and decorate in ½ hours time suitable to industry
E. Help students by individual instruction to make a piece of garland	E. Each student to make a 3' section of garland	E. Student will be able to make garland to a given length suitable to business

Code - 01.0502-05

Title - PRODUCING CHRISTMAS DECORATIONS

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Potted plants	
Objective 4 Student will identify a Christmas potted plant	. Poinsettia (red, white, pink) . Calanchoe . Cineraria . Mums . Christmas cactus
Dress Christmas potted plants	. Pine . Birch branches . Ribbon . #23 18" wire . 8" picks . Foil
Wrapping Christmas plants	. Wrapping paper . Green or white wax paper . Stapler

01.0502-05 - Code

PRODUCING CHRISTMAS DECORATIONS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Specimen plants shown to each student; explain the care given to each, as to water, light, heat	A. Student will see, feel, smell, and note each plant	A. Student will be able to identify the various Christmas plants
B. Demonstrate how to wrap the plants and what is done to spruce them up for Christmas sales: poinsettia and mums have pine branches and birch branches put in with plant, the pot is foiled and a bow is inserted in the pot. The calanchoe, cineraria, and Christmas cactus are just foiled and have a bow	B. Each student will dress the plants with pine, foil, bow, and birch branches	B. Student will be able to dress correctly any of the specified plants
C. Demonstration on wrapping--Tear the correct length of paper (ex: poinsettia) - 3 1/3' long, lay on table with wax paper on top; lay plant on lip of pot and roll with paper, 3/4 way around fold in base paper and finish to end of paper--stand, staple on side, and staple top closed	C. Each student to wrap one of each plant	C. Student will be able to wrap various varieties of Christmas plants to industry standard

MODULE OF INSTRUCTION

Title - PRODUCING CHRISTMAS DECORATIONS Code - 01.0502-05

RESOURCE MATERIALS

Books - Flowers and Plants for Interior Decoration
Wheeler, Esther and Lasher, Anabel Combs,
Hearthside Press, Inc., N.Y. 1957

Bulletins - Tele-flora) Christmas Bulletins revised each year
F.T.D.) Florist's Transworld Delivery Association
Detroit, Michigan

Slides - Indoors and Outdoor Christmas Decorations
Slide Set FL10 - Cornell Film Library
15 slides - 30¢ 1-day rental fee

- Winter Bouquets - Slide Set FL3-
Cornell Film Library - 30¢ 1-day rental
10 slides

Magazines - The Exchange Magazine, Florist and Nursery Exchange
434 South Wabash Avenue
Chicago, Illinois 60605

- Florists Review - The Florist's Publishing Company
343 South Dearborn Street
Chicago, Illinois 60604

MODULE OF INSTRUCTION

Title - RETAIL FLOWER SHOP OPERATION AND MANAGEMENT Code - 01.0502-06

DESCRIPTION:

In this module the student will study the operation and management of the retail flower shop including an actual experience of working in a retail flower shop under the supervision of the shop manager and the instructor.

The content will include shop layout and design, retail merchandising, and delivery of floral arrangements.

DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Retail Flower Shop	2	2
2. Merchandising Product	4	8
3. Labor Relations	2	
4. Applied Shop Management	2	10
	10	20

Revised June, 1974

MODULE OF INSTRUCTION

Title - RETAIL FLOWER SHOP OPERATION AND MANAGEMENT Code - 01.0502-06

OBJECTIVES to be obtained:

The student will be able to:

1. Have investigated the potential for a retail flower shop in his area.
2. Plan a physical set up for a retail flower shop that would be an asset to the community and suitable for a given volume of business.
3. Determine a method for pricing of products that is acceptable in the industry.
4. Plan for the ordering of flowers, greens, containers, and other materials for the operation of the flower shop based on a given situation for a period of a week.
5. Plan and construct a window display for a holiday period.
6. Plan and construct a display of merchandise for a table for a holiday period.
7. Plan a total program for advertising for a retail flower shop for a given period of time.
8. Prepare advertising for the local newspaper for a given situation.
9. Prepare radio advertising commercial for a retail flower shop in a given situation.
10. Set objectives for personnel management by listing ten methods an employer may use to stimulate the working force into productive efficiency and longevity.
11. Plan a training program for each of the following jobs for the flower shop employees:

    Sales Personnel
    Delivery Man
    Office Worker
    Designer

Code - 01.0502-06

Title - RETAIL FLOWER SHOP OPERATION AND MANAGEMENT

OBJECTIVES BY UNIT	CONTENT
Unit #1 - The Retail Flower Shop Objective #1 - Investigate the potential of the retail flower shop in a given area	A. General information of flower shops in the State and region . Economic factors Volume of business . type of sales . general income . People involved . family . full time . part time . Jobs existing . full time . part time . Characteristics of business . small shops . seasonal nature . holidays . industry that plays on emotions of the customers B. The local Area . Population base . Income level . Number of shops and workers in area . Approximate volume of business

E D U C A T I O N

01.0502-06 - Code

RETAIL FLOWER SHOP OPERATION AND MANAGEMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture discussion of the retail industry - use clients and other materials - FTD or other trade organizations - extension specialist for horticulture at Cornell - personal experiences while working in the industry. B. Retail Flower Shop Management Information on job possibilities and supervised study. C. Field trip to area shops to observe and talk with personnel. D. Guest lecturer to class to talk about the industry in the area. E. Slides of instructor and flower shops and/or visits of operations some of which are not in the area but offer ideas for the future. F. Study census data and other information in area for item No. 5 of content. G. Student survey local area for shops and job opportunities. H. Other reference materials - see reference list in back of Retail Flower Shop Manual.	Identification of shop possibilities and jobs in the area.	Written report on possibilities for employment in the retail industry in the area.

Code - 01.0502-06

AGRICULTURAL

Title - RETAIL FLOWER SHOP OPERATION AND MANAGEMENT

OBJECTIVES BY UNIT	CONTENT
Objective #2 Plan a physical setup for a retail shop that would be an asset to the community and suitable for the volume of business.	A. The shop location - characteristics . Exterior appearance . construction . display windows . appearance . business traffic . parking for customers . parking for employees . loading and service area . area of town . Interior display areas . windows . cases . shelves . cooler . order desk and cash register . furnishings . lighting . materials and display . pottery and dishes . impulse items . arrangements . permanent arrangements . living arrangements . plants . foliage . flowering . dish gardens . other materials . floor coverings . walls B. Work Room . Storage facilities . ribbon and small materials . funeral materials . holding materials . flower containers . Work facilities . convenient . lighting . stations . floor covering . walls . wrapping facilities . Walk-in Cooler . size . convenience . lighting . storage

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Lecture Discussion - using slides, overhead projectors, and flow charts of the physical set up of flower shop. Visit several shops to see their arrangements for comparison followed by a written report. Divide class into groups to design a floor plan for a shop that would be able to serve a given community that will reflect an orderly flow of work and convenience to customers and employees. Selected references, and photographs and slides for student study and evaluation.	Written report Preparation of floor plan by group together with explanation of the plan.	Written report of the visits to the shops and comparison Floor plan of groups and oral presentation.

OBJECTIVES BY UNIT	CONTENT
Objective # 2 - Continued	. Loading Area storage desk door space C. Office . Space . Equipment . Furnishings . Consultation space D. Storage Facility . Out-of-season materials . Inventory E. Trucks

E D U C A T I O N

01.0502-06 - Code

RETAIL FLOWER SHOP OPERATION AND MANAGEMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
	9	

Code - 01.0205-06

A G R I C U L T U R A L

Title - RETAIL FLOWER SHOP OPERATION AND MANAGEMENT

OBJECTIVES BY UNIT	CONTENT
Objective #3 Determine a method for pricing the product that is acceptable to the industry	A. What is Profit? . Earning made after all costs have been deducted from Selling Price. B. Retail Price based on . Supply-demand . Wholesale price . Total cost . wholesale cost of materials . overhead costs . rent . interest on investment . insurance . bad debt . labor . advertising and promotional . delivery cost . management . Competition . Volume of business
Objective #4 Plan the ordering of flowers, greens, containers, and other materials for the operation of a flower shop, based on a given situation for a period of a week.	A. Current inventory of materials B. Standing orders for flowers, greens C. Advance orders . Standing, for homes and offices . Special orders, as . weddings . parties D. Holiday . Past experience on demand E. Daily Morning Newspapers . Death . Engagements . Special events . Births F. Experience . Hospital anticipations . Home and office

E D U C A T I O N

01.0205-06 - Code

RETAIL FLOWER SHOP OPERATION AND MANAGEMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Lecture Discussion of costs in the industry based on experience, tape interviews with florists - wholesale people and salesmen. Supervised study using selected references and trade catalogs with current price lists. Wholesale listings of flowers and greens from local flower markets. Visit to shops to observe retail prices and figure backwards. Have several students make basic arrangements for the class to determine cost of materials, overhead costs, selling price and profit.	A. Price list construction for flowers greens containers holders B. Calculation of costs of arrangements and profits	Test using either arrangements or situation problems to determine prices
Lecture discussion of the problems in keeping enough materials on hand without over or under ordering. Tape interview with several florists as to the methods they use for determining a current inventory and how they meet given kinds of situations. Using the current week morning paper, plan for a given number of arrangements based on death, birth, engagements, and special events for a week. Plan basic arrangements for each of the above based on the price structure. All arrangements based on those made previously in modules 01.010404-01, 02, 03, 04, 05.	Prepare a daily history of arrangements to be made and flowers to use for arrangements, and make daily orders to wholesale houses for materials.	Arrangements determined for price indicated - materials selected.

Code - 01.0502-06

Title - RETAIL FLOWER SHOP OPERATION AND MANAGEMENT

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Merchandising Product Objective #5. Plan and construct a window display for a holiday period.	Refer to modules 01.0205 Advertising Services - 01 Display and Advertising of agricultural products.
Objective #6. Plan and construct a display of merchandise for a table for a holiday period.	Refer to Module 01.0205 Advertising Services - 01 Display and advertising of agricultural products.
Objective #7. Plan a total program for advertising for a retail flower shop for a given period of time.	A. Newspaper B. Radio C. Displays D. FTD E. Cooperative effort F. Gifts G. Complimentary arrangements H. Other

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Lecture - discussion of elements of good design built around a given theme. Slides of window displays showing good design and ideas for discussion. Plan the display by students with individual instruction. Construct the display.	A. Planning of Display B. Collect Materials. C. Construct the display.	A. Student interest B. Ideas - quality work - C. Have final evaluation and criticism done by representative of industry.
(Same as Objective #5.)	Same as Objective #5.	Same as Objective #5.
Selected references - and review from above. Determine costs for media advertising.	Plan Program.	Written plan for advertising program.

Code - 01.0502-06

Title - RETAIL FLOWER SHOP OPERATION AND MANAGEMENT

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Objective #8. Prepare advertising for the local newspaper for a given situation.	Refer to modules 01.0205 Advertising Services - 01 and 02 Display and Advertisments of Agricultural Products.
Objective #9. Prepare radio advertising commercial for a retail flower shop in a given situation.	Same as Objective #8. (above)

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Examination of prepared news advertisement of industry. Trade papers, FTD materials. Each student plan an advertisement for the paper stressing - Promotion of material Appearance at correct time Technique.	A.Plan an advertisement. B.Evaluation of other's work.	Student evaluation of advertisement.
Discussion of what makes for a good Commercial - Tape of several from local radio station. Students plan and tape several commercials. If school has a PA system use commercial to promote sales of flowers, plants, etc. for Horticulture Club.	A.Preparation of commercial B.Listening to commercial C.Criticism and evaluation.	Student evaluation.

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Objective #10. Set objectives for personnel management by listing ten methods an employer may use to stimulate the working force into productive efficiency and longevity.	A. Job Description . Clearly stated and defined B. Delegation of authority . Duties . Responsibilities C. Wages . Part time help . Full time help . competitive . reflect experience D. Benefits . Vacations . Hospitalization . Other E. Hours of work . Holiday problems . Regular working hours F. Incentives and involvement G. Training of employees H. Working conditions I. Select new employees carefully . Written application . Interview . Previous experience . Reference J. Make the employee feel wanted and a part of the team. K. Attitude of Employer and employee. See Module 01.010404-01 Farm Labor Management for further development.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Supervised study using references Tape interview with several shop owners as to their labor relations programs. Use trade magazines "help wanted" section for discussion. Have students prepare short talk on topic "would you like to work for yourself - what you would do as the employer and what you would want as the employee." List of 10 methods employer may use.	A. Preparation of oral topic. B. Presentation of topic. C. Preparation of list.	List development.

Code - 01.0502-06

A G R I C U L T U R A L

Title - RETAIL FLOWER SHOP OPERATION AND MANAGEMENT

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Applied Shop Management Objective #11. Plan a training program for each of the following jobs for the flower shop employees: Sales Personnel Delivery Man Office Worker Designer	A. Sales Personnel . Federal . four parts of the selling act . greeting the customer . identification of customer needs and desire . showing of merchandise . completion of the sale . selling by telephone . FTD program . rules for selling by phone (see flower shop management for content) . Writing the order . completely . to the standard of the trade . FTD orders . For delivery . Cash and Carry . preparation of the card . Wrapping Materials . boxing . Loose wrapping of cut flowers . arrangements . potted plants . Handling merchandise . stocking shelves . display creations . dusting and cleaning materials . Customer relations . problems . knowledge of the product . materials . prices . Receiving telephone orders . correct to standards of the industry . FTD incoming . Telephone orders out of town . correctly to standard of industry . Design work Dress Standards - . uniforms . personal appearance B. Delivery Man . Package orders . wrapping materials - see above . Proper loading of vehicle . Prepare route ticket . Deliver materials . shop standard procedure for . funeral homes . hospitals . wedding . churches

EDUCATION

01.0502-06 - Code

RETAIL FLOWER SHOP OPERATION AND MANAGEMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Review Modules of flower arrangements to be sure all students are capable of doing work. Instructor go over with students each item in the list so that all students are able to: . Wait on a customer . Prepare orders carefully . Process FTD Orders, incoming and outgoing . Write cards . Wrap materials . Handle merchandise . Use telephone correctly . Use delivery van . Make deliveries . Keep necessary records . Handle receipts . Follow the flow chart of the business for an order to final disposal. . Handle materials Make arrangements for each student to be assigned to a flower shop for at least 5 days of experience as a worker in a shop.		A. To standard of the industry for student to perform tasks. B. Instructor evaluation daily in the place of employment. C. Employer or shop manager evaluation to standard of the industry. D. Through use of check lists for degree of competency student is evaluated. The final weight for grading should be 70% - employer or shop manager. 30% instructor.

OBJECTIVES BY UNIT	CONTENT
Unit 4. - Objective #11. (continued)	. Repair damaged arrangements . Handle customer receipts . Spare time odd jobs . Dress standards C . Office Worker . General office procedures as: . typing . filing . letters and reports . general telephone . billing . Special horticultural training . telephone orders FTD in and out of shop local trade . sales work . knowledge of materials . prices . all other sales type of work . design work . Designer . design and construct • home arrangements • hospital • funeral tributes • arrangements for special occasions . select plant materials and other supplies . wrap materials • box • loose wrapping of cut flowers • arrangements • potted plants . Write cards and addresses See modules 01.0502-01, 02, 03,04,05 for further details.

EDUCATION

01.0502-06 - Code

RETAIL FLOWER SHOP OPERATION AND MANAGEMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES

MODULE OF INSTRUCTION

Title - RETAIL FLOWER SHOP OPERATION AND MANAGEMENT Code - 01.0502-06

RESOURCE MATERIALS

A. Books -

Flower Shop Operation as a Career. The Florists Transworld Delivery Association, Detroit, Michigan.

Modern Florist Designing. Soules, Ken, Florists Publishing Co., Chicago, Ill, 1957.

Opportunity for You in the Florist Industry. Society of America Florists, Sheraton Park Hotel, Washington, D.C.

Profile of the Retail Florist Industry. Marketing Research Report 741, Economic Research Service, USDA 1964.

The Retail Florist Business. Pfahl, Peter B., The Institute Printers and Publishers, Inc. Dansville, Illinois.

MODULE OF INSTRUCTION

Title - Introduction to Growing Greenhouse Crops   Code - 01.0503-01

DESCRIPTION:

This module engages students in review of common types of greenhouse structures and provides experience in locating greenhouses.

Correct methods for preparation of soils and controlling greenhouse environment through use of fans, CO_2 systems and related equipment are included in the module.

Students are involved in preparing soil for bench and pot crops. Critical cultural operations such as watering, fertilizing and spraying greenhouse crops are included in the module. Students learn to operate water breakers and automatic watering systems needed to provide adequate moisture to greenhouse crops. Proper methods of liquid fertilizer proportioner operation to provide maximum growth and yield on a per square foot basis are also included in this module.

Students also will be involved in pinching, budding, lighting, and shading procedures according to greenhouse crop growing schedules.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	 Other
1) Greenhouse location, structures, and equipment	3	1
2) Cultural requirements for growing greenhouse plant crops	3	
3) Growing selected greenhouse crops	2	21
	8	22

MODULE OF INSTRUCTION

Title - Introduction to Growing Greenhouse Crops

Code - 01.0503-01

OBJECTIVES to be obtained:

The student will be able to:

1. List 8 major reasons why greenhouses have been built in certain locations.
2. Identify the major types of greenhouses and their structures.
3. Identify and use special equipment in a greenhouse.
4. Differentiate, by oral explanation, the importance of atmospheric control and methods used to maintain the correct temperature, carbon dioxide, relative humidity, soil type, light intensity and time to maturity in a greenhouse.
5. Prepare soil mixtures for greenhouse crops.
6. Select 3 of 5 greenhouse crops and give reasons for selection including factors such as similar temperature, soil type, light conditions and time to maturity based on market value or time of year.
7. Bench and pot various types of greenhouse crop plants.
8. Water and fertilize greenhouse crop according to growing schedules for specific crops.
9. Plan and expedite an insect preventative spray program for the greenhouse crop plants.
10. Select the proper temperature control range for greenhouse crop plants.
11. Set controls for light schedules required for specific greenhouse crop plants.
12. Record crop progress and make adjustments in growing conditions to meet bloom date schedule.

Title - Introduction to Growing Greenhouse Crops

OBJECTIVES BY UNIT	CONTENT
Unit 1 Greenhouse, location, structures and equipment. Objective 1 List 8 major reasons why greenhouses have been built in certain locations.	A. Purpose of Greenhouse Structures B. Location of Greenhouse Ranges . Markets . distance . Value of products . Transportation facilities . highways . airports . Amount of winter sunlight . hills . position of greenhouse . Weather . heavy snow . hail . Availability of heat and power . Available labor . Taxes
Objective 2 Identify the major types of greenhouses and their structures.	A. Parts of a Greenhouse . Framework . temporary . semipermanent . permanent . Glazing materials . glass . plastic films . polyethylene films . vinyl film . mylar polyester film . fiber glass

EDUCATION

01.0503-01 - Code

Introduction to Growing Greenhouse Crops Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Discuss and demonstrate a range utilizing overlays on overhead projector for locating a (Greenhouse crop production) Penn. State page 13.	A. Students will be given a certain location to determine if it is feasible to build or locate a greenhouse for that particular area.	A. Orally or in writing, explain rationale for locating a greenhouse for a certain area designated by the Instructor.
B. Arrange a class field trip to several greenhouse camps to familiarize students with the greenhouse locations and facilities available.		
C. Have a plan of your own area and discuss location and facilities available.		
D. Invite a resource person, county extension agent to discuss the importance of locating a greenhouse.		
A. Demonstrate and discuss greenhouse structures to students in lab.	A. Students will be able to recognize and know the structural parts of a greenhouse.	A. Students will take a lab practical for identifying the structures in your own greenhouse. Using a set of slides, students will identify 5 greenhouse structures, and name the parts of the frame and glazing material.
B. Arrange a class field trip to several greenhouse ranges to familiarize students with greenhouse structures.	B. Students check light levels and order various greenhouse coverings and determine most practical types of material for specified condition.	
C. Show slides and discuss the different types of greenhouse structures with class or IMS Cornell (Greenhouse Structures)		
D. Relative costs per square foot and light transmissability of various greenhouse coverings are reviewed.		

OBJECTIVES BY UNIT	CONTENT
Unit 1 cont. Greenhouse Location Structures and Equipment Objective 3 Identify and use special equipment in a greenhouse.	A. Ventilation Equipment . Exhaust fan . Automatic ventilator . Manual ventilator . Wet pads . Polyethylene tube . Fans B. Watering Systems . Water breaker . Automatic mist system . Hozon fertilizer proportioner . Headers or spaghetti . High velocity nozzle . Low velocity nozzle C. Cooling Systems D. Thermostat E. Refrigerator F. Interval Timers G. Automatic Light Timer H. Soil Test Kit I, Hand Sprayers J. Heat Tape K. Pots and Flats L. Benches and Beds
Unit 2 Cultural Requirement for Growing Greenhouse Crops Objective 4 Differentiate by oral, explanation the importance of atmospheric control and methods used to maintain the correct temperature, carbon dioxide, relative humidity, soil type, light intensity and time to maturity in a greenhouse.	A. Atmosphere Control . Proper ventilation . definition . temperature . air circulation B. Temperature . Kind of plant . Growth characteristics . Quality of crop . Heating systems . Automatic sash C. Carbon Dioxide . Growth and quality . CO_2 level . Types of CO_2 generators D. Relative Humidity . Definition . Control . heat . air circulating fans . syringing . shading

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate and discuss the different kinds of equipment to students in lab.	A. Students will recognize and know the functions of the different types of equipment in a greenhouse operation.	A. Orally explain each type of equipment in the greenhouse.
B. Arrange a class field trip to several greenhouse ranges to familiarize students with greenhouse equipment.		
C. Invite a guest speaker to discuss the different kinds of equipment with class.		
D. Slides IMS Cornell Greenhouse structures and equipment.		
A. Invite a resource person, physical plant manager of a greenhouse or his representative, to discuss the importance of atmospheric control.	A. Students will be able to differentiate between the different types of controls for maintaining the environment in the greenhouse.	A. Orally explain the different types of controls used for controlling the environment in the greenhouse.
B. Discuss and demonstrate proper techniques for controlling the environment in a greenhouse. Show examples of improper atmospheric control for crop plants.	B. With given cultural condition, students will be able to adjust greenhouse temperature, light conditions and humidity to match specified condition.	
C. Discuss and demonstrate methods used to control the environment in your own greenhouse.		
D. Show slides and discuss the importance of controlling the environment for crop plants.		

OBJECTIVES BY UNIT	CONTENT
Objective 4 cont.	E. Light Intensity . Photosynthesis . Photoperiod . Plant growth . Shading . spray . blackcloth F. Soils . Soil type . texture . definition . size . proportion . charge . negative . positive G. Soil Structure . Definition . Dispersed . Granulation . Pore space

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
E. Discuss and demonstrate how plant growth can be retarded by shading some plants in lab. .Experiment: . Take a cardboard box and cut a small hole to one side. Place box over plant and let students observe the direction of plant growth.	E. Note taking and participate in class discussion.	B. Teacher evaluation of students lab experiment.
F. Discuss and demonstrate in lab the different methods used to determine soil type and structure. .Experiment in lab #1 . pour water over rocks . pour water over sand . pour water over silt . pour water over clay . check the water holding capacity of each . then demonstrate the proper mixture of the different soil types. .Show students how to moisten soil and ribbon it out to determine soil type.	F. Strive to recognize the different properties of soils and their proper function in a soil make up.	C. Lab practical to differentiate between the different types of soils and their properties.
G. Show slides to class. IMS Cornell - (Soils)		
H. Cornell leaflet IMS - Soil structure and soil texture		

Title - Introduction to Growing Greenhouse Crops

OBJECTIVES BY UNIT	CONTENT
Unit 2 cont. Objective 5 Prepare soil mixture for greenhouse crops.	A. Soil Mixtures . Heavy soil (clay loam) . Medium soil (silty loam) (sandy clay loam) . Light soil (sandy loam) B. Mixtures without soil . U.C. Mix . Peat-lite mixes . A . B . Perlite & vermiculite
Objective 6 Select 3 of 5 greenhouse crops and give oral reason requiring conditions of similar temperature, soil type, light conditions and time to maturity based on market value or time of year.	A. Selection of Crop and Type of Crop . Temperature requirements . Soil requirements . Light requirements . Cut flower crop . Potted plant . Foliage plant
Unit 3 - Growing selected greenhouse crops Objective 7 Bench and pot various types of greenhouse crop plants.	A. Aseptic Technique - (1f-10) . Sterilize soil . Sterilize pots, flats or bench . Dibble board B. Selected Medicine . Soil mixtures . Mixtures without soil C. Selecting pot or flat . Size . Soil line . Number of cuttings per pot or flat. D. Transplanting . Root system . Depth of cutting . Fill soil around roots E. Firming the soil . Tap pot lightly on bench . Water

01.0503-01 - Code

Introduction to Growing Greenhouse Crops - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate and discuss with students in lab. B. Field trip to local greenhouse to discuss and show the students different soil mixtures. C. Guest speaker to discuss soil mixtures	A. Student will be able to select his own soil mixture for growing greenhouse crop plants.	A. Given soil mixture, identify and discuss the composition for growing a particular greenhouse crop.
A. Show 8 samples of mature or harvested greenhouse crops, 5 of which requiring like, temperatures, soil and light conditions so that student may select 3 of 5 for his project. B. Lecture and discussion on the 8 crops as to cultural requirements.	A. Student selects 5 out of 8 greenhouse crop plants that have the same environment requirements.	A. Students will give an oral explanation why he selected the 5 plants, as he did.
A. Discuss and demonstrate to class in lab proper potting techniques. B. Field trip to a local greenhouse range to observe and discuss potting and benching of greenhouse crop plants. C. Invite a resource person, to discuss potting and benching of greenhouse crop plants.	A. Pot or bench greenhouse crop plants using proper techniques to obtain optimum growth.	A. Demonstrate and discuss the proper procedure for potting and benching greenhouse crop plants.

Title - Introduction to Growing Greenhouse Crops

OBJECTIVES BY UNIT	CONTENT
Unit 3 cont. Objective 8 Water and fertilize greenhouse crop according to growing schedules for specific crops.	A. Watering greenhouse crop plants . How frequent . foliage . media . geographical location . temperature . relative humidity . type of pot . When should you water . dryness of soil at touch . soil is lighter in color . wilting of leaves . Procedure for watering . Top .saturate completely . leaching of soluble salts . roots get water .water runs out bottom of pot .repeat only when plant needs watering . Bottom .set pot in tray of water .approx. 20 minutes .repeat only when plant needs watering . approx. once a week

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Discuss and demonstrate in lab proper watering techniques and symptoms of water deficiency or over watering greenhouse crop plants.	A. Note taking and, discussion.	A. Discuss and demonstrate the proper procedure for watering greenhouse crop plants.
B. Arrange a field trip to a local range to observe their watering techniques.	B. Discuss and demonstrate ability to water plants properly in lab.	
C. Invite a guest speaker to discuss watering techniques.		
D. Lecture and stress the importances of watering greenhouse crop plants.		
E. Students experiment in lab . Have students select 3 plants . Water plants as follows: . Water plant very lightly - break plant away from pot and show water line. . Over water a plant-look for symptoms. . Water plant properly. . Have student observe plants and write up the results. . Discuss results with class.		

OBJECTIVES BY UNIT	CONTENT
Unit 3 cont. Objective 8 cont.	B. Fertilizing . Factors to consider before fertilizing . soil analysis . water is consistent . rate of plant growth . time of year . Workout a fertilizer schedule . concentration . liquid fertilizer . slow release fertilizer . time period . Methods of application . mix with potting soil . hozon . injectors . Fertilizing crop plants . soil should be moist before applying the fertilizer . apply liquid fertilizer until it runs out of the bottom of pot.
Objective 9 Plan and expedite an insect preventative spray program for the greenhouse crop plants.	A. Factors to consider for a preventive spray program. . Preventive spray program for insects . proper handling . prevent bruising and breakage . weeds and trash . breeding areas . outdoor areas . keep grass moved near greenhouse . clean culture . spray or dusting while plants are young . soil sterilization . purchase disease free stock

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Discuss and demonstrate in lab the proper procedure to use when fertilizing greenhouse crop plants.	A. Students will be able to analyze the soil and write up their own fertilizing schedule for greenhouse crop plants.	A. Teacher evaluation of prepared fertilizing schedule, including a discussion of 4 factors considered in preparing the schedule.
B. Have students set up or experiment in lab . Select tube plants . apply normal fertilizer to 4 plants . don't apply fertilizer to 4 plants . overfertilize 4 (double proportion) plants . Have students observe plants and write up the results. . Discuss results with class.	B. Student will be able to apply the right amount of fertilizer to greenhouse plant crops by methods such as: liquid feed dry application slow release fertilizer	B. Demonstrate in lab the ability to fertilize greenhouse crop plants.
C. Discuss and demonstrate the proper procedure for mixing a fertilizer solution and applying liquid with the Hozon method or injector.		
A. Discuss and demonstrate in lab proper handling of seedlings and preventive measures to take when working with greenhouse crop plants.	A. Students will be able to set up a preventive spray program for growing greenhouse crop plants.	A. Written or an oral report of preventive spraying program.
B. Lecture to students about preventive measures to take in order to control disease and insects.		
C. Arrange a field trip to a local greenhouse to discuss a preventive spray program.		
D. Invite a guest speaker to discuss a preventive spray program.		
E. Discuss and demonstrate a preventive spray program utilizing overlays on overhead projector.		

OBJECTIVES BY UNIT	CONTENT
Unit 3 cont. Objective 10 Select the proper temperature control range for greenhouse crop plants.	A. Selecting the proper temperature range . Temperature control must be precise . for each kind of plant in the greenhouse . type of growth desired . Alterations in temperature if too high or low . cooler temperatures . develop and grow slowly . shorter and heavier . death . higher temperature . grow more rapidly . taller and thinner . death . Temperature adjustments may be used . control quality of crop . induce flowering (higher temperature) . retard flowering (lower temperature)
Objective 11 Set controls for light schedules required for specific greenhouse crop plants.	A. Light intensity . Definition . Controls . photosynthesis . plant growth . of foot candles . Low light intensity . winter . slower growth . less vigorous than in spring, fall and summer . High light intensity . plants are short . heavy stems . small light colored leaves . bleached flower colors . Plants not affected by light intensity . flower anytime . growth is normal . Methods of controlling light intensity . spray a shading compound . place muslin, tobacco cloth, or plastic screen above plants. B. Duration . Photoperiodism . Critical day lengths . short day . long day . intermediate . Methods of control . black cloth . automatic light timer . Response of some plants . induce flowering . vegetative growth only

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Discuss and demonstrate proper temperature control in lab. B. Arrange a field trip to a range and discuss the methods used to control temperature for a wide variety of plants or a specific variety. C. Invite a guest speaker to discuss temperature control. D. Lecture to students and discuss regulating temperature in a greenhouse for crop plants.	A. Select the proper temperature range for a particular crop or a variety of greenhouse crop plants.	A. Orally explain how to control temperature in the school greenhouse or a greenhouse observed during a field trip for a given crop.
A. Discuss and demonstrate light intensity in lab. B. Arrange a field trip to a local range and discuss the importance of light intensity and duration of greenhouse crop plants. C. Lecture and discuss with class about light intensity and duration. D. Arrange for a guest speaker to discuss light intensity and duration to class. E. Set up a lab experiment . Select a short day or long day plant . Discuss and help students set up a schedule . Plant cuttings and have students observe the procedure and methods used till flowering. . Exp. Chrysanthemums.	A. Discuss the importance of light intensity and duration for greenhouse crop plants. B. Transplant cuttings and will start to set a schedule for a commercial greenhouse crop plant, as demonstrated.	A. Teacher evaluation of an oral report pertaining to light intensity and duration. B. Teacher evaluation of a schedule for commercial greenhouse crop plant.

OBJECTIVES BY UNIT	CONTENT
Unit 3 cont. Objective 12 Record crop progress and make adjustments in growing conditions to meet bloom date schedule.	A. Plan of work* . Purpose . Organize material . Outline plan B. Cultural practices to follow . Control of insects and diseases . Fertilizers and fertilization techniques . Soil testing . Soil sterilization . Sowing seed . Transplanting plants . Temperature . Watering C. Standard modifications for some specific crop plants . Tropical or semi tropical . higher growing temperature . Higher water absorption of some plants . Younger plants are more susceptible to rot organisms . watering is more critical at this stage

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discuss the importance of having a plan of work for growing greenhouse crop plants.	A. Student will write a plan of work for crop plants involving cultural practices to harvest time.	A. Teachers evaluation of his plan of work for a grade.
B. Arrange a field trip to a local range to discuss their plan of work for their operation.	B. Student will be able to grow a commercial greenhouse crop with specific crop accommodations.	B. Teachers evaluation of students setting up and following his plan of work.
C. Discuss and demonstrate a set of plans utilizing overlays on overhead projector.		
D. Invite a guest speaker to discuss his set of plans for greenhouse crop plant operation.		
E. Have students write out their plan of work for the commercial greenhouse crop plant already selected.		

MODULE OF INSTRUCTION

Title - Introduction to Greenhouse crop production   Code - 01.0503-01

RESOURCE MATERIALS

Books

Bedding plants. Mastalerz, John W. (Ed.) Agricultural Extension Service, The Pennsylvania State University, published by The Pennsylvania Flower Growers, 1966. (IMS, Cornell, Ithaca, N.Y.) H-62

Diseases and pests of ornamental plants. 3rd edition. Pirons, P.P., Dodge, B.D., and Rickett, H.W., Ronald Press, New York, N.Y. 1960.

Flower and plant production. Nelson, Kennard S., The Interstate printers and publishers, Inc., Danville, Illinois, 1966.

Peters Fertilizers. Robert B. Peters Company, Inc. Allentown, Penn., 1968

The Ball Red Book. 11th Edition. George J. Ball, Inc. West Chicago, Ill., 1965. (FMS-H42)

Greenhouse Crop Production.- (lab manual, IMS, Cornell) H.44

Greenhouse Plant Production - (Manual - IMS, Cornell) H.43

Bulletins

Ball Mums - Bulletin No. 310, George J. Ball, Inc., West Chicago, Illinois, 1967

Plant Growth Lighting - H 50 IMS, Cornell, Ithaca, N.Y.

Cornell Ext. 1175. Fertilizer proportioners for Horticulture and Nursery crop production Management.

Cornell recommend for Commercial Horticulture Crops.

Periodicals

Horticulture - 300 Mass. Avenue, Boston, Massachusetts 02115

Florist and Nursery Exchange - 434 South Wabash Avenue, Chicago, Ill. 60605

The Florists' Review - 343 South Dearborn Street, Chicago, Ill. 60604

Audiovisuals

What's in the Bag? (18 min. film) National Fertilizer Association, 616 Investment Bldg., Washington, D.C.

Watering and Feeding, agdex 200/15, 1968-24 colored slides and script.

Greenhouses and related Structures (Slide series IMS Cornell.)

soils (Slide series IMS Cornell) H1.9 factors affecting plant growth (Visuals) H4.5

MODULE OF INSTRUCTION

Title - GROWING BEDDING PLANTS Code - 01.0503-02

DESCRIPTION:

Skills will be developed in the selection of bedding plants, seeds, and varieties. The germinating from seed to marketable plants will also be included as skill development process.

The operations will include the preparation of artificial mixes and the cultural practices used in growing bedding plants.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	 Other
1. Preparing soil and artificial mixes with a power mixer	1	2
2. Selecting and sowing seed varieties	1	4
3. Pricking off seedlings and selecting containers	1	6
4. Watering and fertilization practices	1	5
5. Cultural practices till plant is marketable	1	8
	5	25

Revised June, 1974

MODULE OF INSTRUCTION

Title - GROWING BEDDING PLANTS

Code - 01.0503-02

OBJECTIVES to be obtained:

Each student will:

1. Prepare a soil mix or artificial mix with a soil mixer (cement mixer - ½ or ¼ bag unit) mixing all parts in proper proportion. (This mix can be modified or same as mix described in Cornell Artificial Mix Bulletin).
2. Measure out the correct amounts of fertilizer, limestone and trace elements and mix thoroughly into soil mix or artificial mix.
3. Select seed varieties for future growing conditions.
4. Determine the amount of seed of each variety needed to produce a given number of saleable plants.
5. Schedule the seed sowing dates of all plants grown to produce saleable plants on time, according to local time of sale.
6. Drench flats of soil or artificial mix with an appropriate fungicide, used at recommended rates, in order to prevent damping off of seedlings.
7. Sow seeds in flats, later to be transplanted, providing the necessary conditions so that they germinate in a uniform pattern, and label each flat correctly.
8. Directly sow seeds in saleable containers, such as tomato seeds in Jiffy 7's or melon seeds in three inch peat pots, and provide the necessary conditions for a good germination %.
9. Remove seedlings from the germination flat without damage to plants.
10. Plant seedlings in a selected container at the rate of 200 per hour.
11. Water without dislodging plants or causing container soil displacement, but moisten entire root zone.
12. Measure correctly and add a soluble fertilizer to the correct amount of water making (A) a stock solution to be applied with a proportioner and (B) a fertilizer solution to be applied with a watering can, and apply to plants following correct watering practices.
13. Follow a watering and fertilization schedule correctly.
14. Mix the correct amount of slow release fertilizer with a soil mix or artificial mix.

MODULE OF INSTRUCTION

Title - GROWING BEDDING PLANTS Code - 01.0503-02

OBJECTIVES to be obtained:

Each student will: (continued)

15. Apply a growth retardant to plants, if necessary, according to recommended practices.

16. Follow a disease and insect preventative program and control any disease or insect problems that may arise, according to recommended practices.

17. Culture pricked off plants, following practices mentioned above, to a marketable state.

Title - GROWING BEDDING PLANTS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Preparing soil and artificial mixes. 1. Each student will prepare a soil mix or artificial mix with a soil mixer (cement mixer - ½ or ¼ bag unit) mixing all parts in proper proportion. (This mix can be modified or same as mix described in Cornell Artificial Mix Bulletin).	A. Equipment required for soil mixing . Gas or electric mixer ½ or ¼ bag mixer. . Square shovels and bushels. B. Soil and other growth medium materials (Depends on mix used). . Sphagnum peat moss . Perlite . Vermiculite . Pasteurized screened soil (top soil) . Water
2. Each student will measure out the correct amounts of fertilizer, limestone, and trace elements and mix thoroughly into soil mix or artificial mix.	A. Fertilizer B. Limestone C. Trace elements D. Square shovel
Unit 2 - Selection of seed varieties and determining amount of seed to purchase and sow. 3. Each student will select seed varieties for future growing conditions.	Seed catalogs.

EDUCATION

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GROWING BEDDING PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
The teacher will demonstrate with two students the use of soil or cement mixer in preparing artificial soils. * Note: Use students who have done job before or rehearse with two students.	Each student will mix at least ½ yard of soil or artificial mix before this module is completed.	Teacher observation of student performance.
The teacher will demonstrate, with help of two students, how to mix fertilizer, limestone,. trace elements in mix.	Each student will mix fertilizer limestone, trace elements in a soil or artificial mix before this module is completed.	Teacher observation of student performance.
The teacher will discuss reasons for choosing one variety of plant seed over another.	A. Students will take notes. B. Students will help determine what varieties of seed will be purchased for next year.	Written or oral test.

OBJECTIVES BY UNIT	CONTENT
Objective #4 Each student will determine the amount of seed of each variety needed to produce a given number of marketable plants.	Seed catalogs
5. Each student will schedule the seed sowing dates of all varieties of plants grown, to produce saleable plants on time, according to local time of sale.	A. Ball Red Book B. Environmental factor - temperature
6. Each student will drench flats of soil mix or artificial mix with an appropriate fungicide, used at recommended rates observing all safety precautions, in order to prevent damping off of seedlings.	A. Damping off B. Safety in using toxic chemicals C. Materials . Fungicide - . panodrench . dexon - terraclor . Flat . Soil mix or artificial mix . Respirator . Rubber gloves

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01.0503-02 - Code

GROWING BEDDING PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Using the blackboard the teacher will demonstrate how to determine how much seed is necessary to produce a given number of marketable plants.	A. Students will take notes. B. Students will work out sample problems. C. Students will help determine how much seed of each variety is necessary to produce next year's crop of bedding plants.	Written or oral test.
A. Show students schedule in Ball Red Book. B. Discuss temperature in relation to plant growth.	Have students, using Ball Red Book, record on calendar the dates that the different varieties of seed must be sown on to produce marketable plants on a date in line with local time of bedding plant sales.	Teacher observation of student performance.
A. Discuss damping off with class. B. Discuss safety precautions necessary when using toxic. C. Demonstrate how to drench flat.	Each student will drench a flat of soil mix or artificial mix with an appropriate fungicide observing all safety precautions before this module is completed.	A. Teacher observation of student performance. B. Written or oral test.

OBJECTIVES BY UNIT	CONTENT
7. Each student will sow seeds in flats, later to be transplanted, providing the necessary conditions so that they germinate in a uniform pattern, and labeling each flat correctly.	A. Seedsowing technique . Materials . sieve for application of thin covering of germination mix over seed. . water, hose mist nozzle . vibrator seeder - Battery operated seed dispenser for very fine seed. . flats - wood or plastic . tamp - to fit flat on container for tamping seed mix in place. . seeds . seed germination media B. Labeling . Materials . labels . marking pencil C. Optimum conditions for seed germination . Temperature . Moisture . Air
8. Each student will directly sow seeds in a saleable container, such as tomato seeds in Jiffy 7's or melon seeds in 3 inch peat pots, and provide the necessary conditions for a good germination %.	Materials . Jiffy 7's - tomato seed, pepper seed . Three inch peat pots - melon seed, squash seed.

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GROWING BEDDING PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate how to sow seed uniformly (a) small seeds with vibrator seeder (b) large seeds without vibrator seeder. B. Discuss and draw on board how to correctly label a label. C. Discuss conditions necessary for good germination.	A. Students take notes. B. Students sow seed. C. Students provide seed flats with conditions necessary for uniform germination.	A. Teacher observation of student's performance. B. Uniform germination of student planted seed. C. Written or oral test.
A. Demonstrate seed sowing in saleable container. B. Discuss advantages and disadvantages of this method.	Students will sow seeds in saleable containers and provide the necessary conditions for a good germination %.	Teacher observation of student performance.

Title - GROWING BEDDING PLANTS

OBJECTIVES BY UNIT	CONTENT
Unit 3 - Pricking off seedlings and selection of containers. Objective #9 Each student will remove seedlings from the germination flat, without damage to the plants. Objective #10 Each student will plant seedlings in a selected container at the rate of 200 per hours.	A. Flats or pots - . Market packs . Peat pots . Clay and plastic pots . Wood constructed flats . "Jiffy 7" planters B. Spacing devices Plywood rectangle to fit opening in wood or plastic flat. Pegs affixed to surface of rectangle to given you 40 to 60 holes in mixture, two different rectangles are necessary. C. Dibbles - wood peg to enlarge or make new holes to set plants into. (Mechanical finger). D. Tamping Block - make up toll to press mixture before planting. E. Labels and marking pencil. F. Water can with rose head - or mist nozzle . For watering transplanted seedlings
Unit 4 - Watering and fertilization practices. Objective #11 Each student will water without dislodging plants or causing container soil displacement but moisten entire root zone.	A. Water, hose, mist nozzle (and, or) B. Water, watering can, rose head

EDUCATION

01.0503-02 - Code

GROWING BEDDING PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Teacher demonstrate removal of the seedlings from the germination flat. Seedlings are then placed on the table in preparation of planting. Plant seedlings into container and press into place with fingers. The teacher will then water transplanted seedlings and place them under light shade in greenhouse.	Students will work in teams of two. Each group will set up a planting container. They will then prick off seedlings, plant, label and water.	If plants are standing tall, the next day, the job was done correctly. The students will have their names on the labels. If the plants are bent over and dry, review work with students.
The teacher will demonstrate how to properly water plants.	Students will be assigned to water plants on a daily basis.	Teacher observation of student performance. *NOTE Correct watering procedure is evidenced by adequate root zone moisture levels and soil media around plants uneroded.

Title - GROWING BEDDING PLANTS

OBJECTIVES BY UNIT	CONTENT
12. Each student will measure correctly and add a soluble fertilizer to the correct amount of water making (a) a stock solution to be applied with a proportioner and (b) a fertilizer solution to be applied with a watering can, and apply to plants following correct watering practices.	A. Soluble fertilizer (for Ex. 20-20-20) water, proportioner, hose, mist nozzle, dram, cup measure, weighing scale. B. Soluble fertilizer (for Ex. 20-20-20) water, watering can, rose, teaspoon or tablespoon measure, weighing scale.
13. Students will follow a watering and fertilization schedule correctly.	A. Water application techniques: . Water breaker . Automatic pot and bench systems B. Determination when watering should occur.

EDUCATION 01.0503-02 - Code

GROWING BEDDING PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. The teacher will explain both methods of liquid fertilizer application, and show class a proportioner and explain its operation. B. The teacher will explain how to determine the amount of soluble fertilizer to be added to a given amount of water to give the desired fertilizer concentration. C. The teacher will demonstrate how to apply liquid fertilizer with (a) a proportioner. (b) a watering can.	A. Students will set up a water and fertilization schedule. B. Each student will mix fertilizer and water and apply to plants on his assigned day. C. Students will observe plants for signs of nutrient deficiency.	A. Teacher observation of student performance. B. Written or oral test.
A. Teacher will discuss different time intervals between each fertilizer application in relation to concentrations of fertilizer solution. B. Teacher demonstrates proper use of water break when hand watering bench and pot plantings. C. Calibration of automatic watering controls is demonstraed to insure adequate root zone moisture is maintained.	A. Students set up an automatic pot watering system demonstrating their ability to calibrate and trouble shoot malfunctioning parts of the system. B. Ability to hand water is demonstrated by each student through use of the water break.	(See objective 12)

OBJECTIVES BY UNIT	CONTENT
14. Each student will mix the correct amount of slow release fertilizer with a soil mix or artificial mix.	A. Soil Mix B. Slow release fertilizer such as Osmocote or Magamp.
Unit 5 - Cultural practices till plant is marketable. 15. Each student will apply a growth retardant to plants, requiring one, according to recommended practices.	A. Sprayer B. Water C. Measuring cup D. Growth retardants . B-nine . Phosphon

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
The teacher will explain how a slow release fertilizer works and its advantages and disadvantages as compared to liquid feeding.	A. Students will add a slow release fertilizer to a soil or artificial mix. B. Students will transplant plant into this mix and compare the growth of these plants to those that are fertilized with a liquid fertilizer.	A. Teacher observation of student performance. B. Written or oral test.
A. The teacher will discuss growth retardants and on which plants they should be applied to and why. B. The teacher will demonstrate the two methods of applying growth retardants (drenching, spraying) observing general safety precautions used when working with toxic chemicals.	Students will apply growth retardants to plants, requiring one, observing safety precautions.	A. Teacher observation of student performance. B. Written or oral test.

Title - GROWING BEDDING PLANTS

OBJECTIVES BY UNIT	CONTENT
16. Each student will follow a disease and insect preventative program and control any disease or insect problems that may arise, according to recommended practices.	A. Insecticides - Ex. Malathion, Tedion-Dithio fumigator. B. Fungicides - Ex. Capton thiodon C. Sprayer
17. Culture pricked of plants, following practices mentioned above, to a marketable state.	All objectives previously mentioned.

EDUCATION

01.0503-02 - Code

GROWING BEDDING PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. The teacher will discuss insect and disease preventative programs and different chemicals used (see Ball Red Book). Also, what to do if infestation of insects or disease should occur for rapid effective control. (Such as tedion-dithio fumigator if aphid infestation should occur.) B. The teacher will demonstrate the application of various materials observing safety precautions. C. The teacher will discuss sanitation.	Students will follow a disease and insect preventative program and control any disease or insect problems that may arise, observing all safety precautions.	Teacher observation of student performance.
		A. Teacher observation. A healthy and vigorous growing condition will be maintained at all times. B. Plants raised by students have thrifty, appearance - There is no evidence of disease, inadequate water or plant nutrient supply.

MODULE OF INSTRUCTION

Title - GROWING BEDDING PLANTS Code - 01.0503-02

RESOURCE MATERIALS

A. Books - Ball Red Book- George J. Ball Inc., West Chicago, Illinois 60185

B. Bulletins - Penn State Manual. "Bedding Plants." -
Source - John W. Mastalerz, 101 Tyson Building, The Penn. State University, University Park, Penn. 15802
Cost - $2.00 - make checks payable to Penn. Flower Growers

Cornell Ext. E. 1104. "Cornell Peat-Lite Mix."

Roy M. Sacles. "Seeds and Seedlings."
Dept. of Ag. Ed., University of California, Davis, California

C. Periodicals - Grower Talks - George J. Ball, Inc., W. Chicago, Ill. 60185

Growers Circle News - Yoder Brothers, Inc., Burberton, Ohio 44203

D. Audiovisuals - Film. "Starting Flowers from Seed."
Dept. of Ag. Ed. University of California, Davis, California

MODULE OF INSTRUCTION

Title - GROWING SPECIALIZED GREENHOUSE HOLIDAY CROPS Code - 01.0503-03

DESCRIPTION:

The production of highly specialized holiday crops such as poinsettias, tulips, azaleas, lillies and geraniums, and chrysanthemums require close crop scheduling and knowledge of consumer demands.

Students develop competencies in areas such as selection of holiday crop varieties, varying greenhouse environmental growth conditions according to specific varieties of plant materials and scheduling crops for specific holiday periods.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1 . Holiday Crop Varieties and Cultural Requirements	4	12
2 . Production of Two Holiday Crops	2	12
	6	24

Revised June, 1974

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MODULE OF INSTRUCTION

Title - GROWING SPECIALIZED GREENHOUSE HOLIDAY CROPS Code - 01.0503-03

OBJECTIVES to be obtained:

1. Each student will visit a local greenhouse or nursery and take a survey listing all holiday crop plants grown in that greenhouse or nursery for each holiday (holidays will be determined in class before survey) to be turned into the instructor.
2. Each student will categorize holiday crops on a written or oral quiz according to their unique cultural requirements.
3. Each student will select two out of five specialized greenhouse holiday crop plants that he will produce for particular holidays and state orally why he chose these two plants.
4. Each student will write in class a feasible production plan for each holiday crop he selected.
5. Each student will select and prepare a proper soil mix or artificial mix for each holiday crop plant he selected.
6. Each student will state on a written or oral test, and follow, proper potting techniques for holiday crop plants.
7. Each student will state the importance of atmospheric control, the correct temperature, relative humidity, light intensity and carbon dioxide level for each holiday crop plant grown for a particular holiday and implement these conditions for his two holiday crops.
8. Each student will be able to determine present nutrient levels in soil mix or artificial mix and apply an appropriate fertilizer in the correct amount for each holiday crop plant grown for a particular holiday.
9. Each student will be able to identify on a written or oral quiz, and control insects and diseases for each holiday crop plant grown, observing all safety precautions.
10. Each student will culture two specialized greenhouse crops, of workable quality within a specified time frame.
11. Each student will be able to wrap and prepare holiday crop plants for shipping following correct procedures.

Code - 01.0503-03

Title - GROWING SPECIALIZED GREENHOUSE HOLIDAY CROPS

OBJECTIVES BY UNIT	CONTENT
1. Determining Holiday Crop Plants Grown Locally for a Particular Holiday Objective 1 Each student will visit a local greenhouse or nursery and take a survey listing all holiday crop plants in that greenhouse or nursery for each holiday (holidays will be determined in class before survey) to be turned in to the instructor.	Introduction A. Importance B. Definition of holiday plants C. Function of holiday plants D. Demand by the wholesaler E. Demand by the consumer F. Demand by the retailer G. Economic factor . List variety of crop plants in demand . geraniums . lillies . azaleas . tulips . poinsettias . hydrangeas . cyclomen . chrysanthemums . What holidays of the year are important . Christmas . Valentines Day . Easter . Memorial Day . Thanksgiving . List holiday crop plants in demand for your own area . Christmas . Valentines Day . Easter . Memorial Day . Thanksgiving .Students will take local survey .Students take notes
2. Production of Holiday Crops Objective 2 Each student will categorize holiday crops on a written or oral quiz according to their unique cultural conditions.	Requirements and characteristics for the production of: A. Poinsettias . Cultivar . Propagation . Control of flowering . Watering . Pinching . Timing . Regulating poinsettia growth B. Lillies . Cultivar . Propagation . Full size . Precooling . Planting . Watering . Timing . Straight stems . Height control C. Tulips . Cultivar . Forcing . potted plants . cut flowers . Flowering season . Size of bulbs . Timing D. Azaleas . Production . cuttings . grafting . Liners . Size of plant . 2 pinch . 3 pinch . Yoder line . Media . timing E. Geraniums . Popularity . Propagation . Media . Varieties . Timing . Chrysanthemums . Durability . Lighting conditions . Pinching schedule

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Teacher will discuss with class important holidays B. Assign survey to students C. Teacher will list holidays on board, students will discuss specific holiday crop plants they found important for a particular holiday and teacher will list plants under holidays on board. D. Collect student survey sheets	Students will take local survey Students take notes	Teacher will check each student's survey for completeness.
A. Teacher develop concepts using overhead projector B. Have your local greenhouse manager as a guest speaker C. Class discussion--list reasons on blackboard D. Field trip to a local greenhouse and discuss each crop with manager E. Filmstrip--Ornamental Plants (IMS Cornell)	For given greenhouse area, and location, each student determine the special factors that need consideration for holiday crop production: Factors include: . lighting . ventilation . fertilization . pinching . spacing . heating . cooling . shading . misting . watering	Written or oral quiz

Code - 01.0503-03

Title - GROWING SPECIALIZED GREENHOUSE HOLIDAY CROPS

OBJECTIVES BY UNIT	CONTENT
Objective 3 Each student will select two of five specialized greenhouse holiday crop plants that he will produce for particular holidays and state orally why he chose these two plants	A. Selection of holiday crop plant . Holiday desired . timing . Temperature . Light requirements . Spacing
Objective 4 Each student will write in class a feasible production plan for each holiday crop he selected	A. Production plan . Prepare a "deadline" day for each phase of production . indicate exact dates . What to incorporate in your plan . container size . single stem . branched .total pots .plant/pot .cuttings required .final space (sq ft) .sales price/pot . Cultural procedure . planting date . temperature . light . watering . spray with growth regulators . pinching dates . spacing . date
Objective 5 Each student will select and prepare a proper soil mix or artificial mix for each holiday crop plant he selected	A. Soil structure, texture, and mix for holiday crop plants . Poinsettias - soil mixture should provide good drainage and aeration and yet have good water holding capacity . pg. 87-Greenhouse Crop Production Penn State--(IMS Cornell) . Lillies - Soil medium should be well aerated and easily drained. Also must have good water holding capacity . good medium . equal parts of topsoil . medium grade sand . other coarse material . peat moss . Geraniums - Soil mixture should be porous, not too high in organic matter; steamed. . Azaleas - Soil mixture should be coarse and add peat moss to hold mixture in soil . Tulips - Well drained soil mixture, similar to poinsettias

EDUCATION

01. 0503-03 - Code

GROWING SPECIALIZED GREENHOUSE HOLIDAY CROPS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Show 5 examples of mature plants and have students select two for his project. B. Teacher develop concepts using overhead projector C. Field trip to local greenhouse	. Student will select two of five holiday crop plants to produce in lab	Student will give an oral explanation for selecting his two holiday crop plants for lab
A. Teacher demonstrates a production plan on an overhead projector. B, Handouts-Show students a production plan for some crop plants C. Have a guest speaker from a local nursery come in and discuss the importance of a production plan D. Handout an outline of a production plan to students	Students write production plan	Student will hand in a feasible production plan for his two holiday crop plants selected in class
A. Discuss materials used for making soil or artificial mixes B. Discuss qualities of soil or artificial mix necessary for different specialized greenhouse holiday crops C. Discuss and list on board % of each material used to make proper soil or artificial mix for specialized greenhouse holiday crops D. Demonstrate how to mix a soil or artificial mix correctly	A. Students take notes B. Students will mix soil or artificial mixes for their particular crops	Teacher observation of student's performance

OBJECTIVES BY UNIT	CONTENT
Objective 6 Each student will state on a written or oral test, and follow, proper potting techniques for holiday crop plants.	Procedure for potting plants . Aseptic technique . sterilize . tools . pots . soil . other . Select the right size pot . Fill pot with 2/3 soil . Plant cutting . Fill soil or artificial mix around cutting . Tap pot lightly on bench . Water throughly A. Importance . Definitions . Importance B. Temperature control . Importance . Heating system . Cooling systems . Ventiliation C. Relative Humidity . Definition . Control . fans . syringing . ventilation . mist system D. Light Intensity . Definition . Photoperiod . Controls . light timer . other shading material . cheesecloth E. Carbon Dioxide . Definition . Liquid or dry ice . Amount of PPM . Timing . Generators
Objective 8 Each student will be able to determine present nutrient levels in soil or artificial mix and apply an appropriate fertilizer in the correct amount for each holiday crop plant grown for a particular holiday	A. Introduction B. Take a soil sample, determine the nutrient level in your soil C. Formulating your own fertilizing program . Water is consistent . Time of year . Rate of plant growth D. Superphosphate and materials for pH adjustment . Limestone-add to soils prior to planting E. Fertilizer analysis-NPK F. Soluble salts . Too high G. Fertilizers and application . Slow release-ie. Osmocote, Mag Amp . Soluble fertilizers and proportioners

GROWING SPECIALIZED GREENHOUSE HOLIDAY CROPS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate potting technique to class in laboratory B. Teacher develop concepts using overhead projector C. Class discussion-list the procedure for potting plants	Students will pot three plants during laboratory using aseptic technique	A. Oral or written quiz B. Teacher observation of student performance
A. Class discussion-list the reasons for atmospheric control B. Field trip to a local greenhouse to observe these methods of control C. Demonstrate to class in your own greenhouse D. Teacher develop concepts using overhead projector E. Filmstrip for IMS greenhouse structures	Students will operate all controls and equipment and maintain the proper atmosphere in the greenhouse	A. Written or oral quiz B. Teacher observation of student performance
A. Demonstrate to class in lab B. Class discussion-how to select the correct fertilizer for your crop C. Teacher develop concepts using overhead projector D. Filmstrip from IMS fertilizers E. Guest speaker from local nursery	A. Students will take a soil sample and determine the nutrient level of the soil B. Students will be able to select the correct fertilizer ratio for holiday crop plants C. Students will maintain correct nutrient levels by applying fertilizers	Teacher observation of student performance

OBJECTIVES BY UNIT	CONTENT
Objective 9 Each student will be able to identify on a written or oral quiz and control insects and diseases for each holiday crop plant grown, observing all safety precautions	A. Safety in use of chemical agents B. Recognize insects and disease for holiday crop plants . Insects and mites . recognition of damage in holiday crop plants . identification of insect or mite causing damage . control methods . Diseases . recognition of damage in holiday crop plants . identification of disease agents . control of diseases . Nematodes . identification of damage in holiday crop plants C. Control
Objective 10 Each student will culture two specialized greenhouse crops of marketable quality within a specified time frame.	All practices mentioned above.
Objective 11 Each student will be able to wrap and prepare holiday crop plants for shipping following correct procedures	Preparing plants for market shipping . Stage of development . Grading (SAF) . according to size . free from blemishes . straight stems . Wrapping . flower heads . protects them from being bruised . entire plant . protects if from freezing . Bunching temperatures . number . stems tied . Label including . cultivar . directions for home care

01.0503-03 - Code

GROWING SPECIALIZED GREENHOUSE HOLIDAY CROPS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Review module 7,"controlling insect and diseases and fertilization.	A. Student will take notes	A. Written or oral quiz
B. Teacher should show slide of damage caused to nursery crop caused by insects, diseases, other pests.	B. Student will carry on a disease and insect preventative program observing all safety precautions.	B. Teacher observation of student performance
C. Teacher prepared collection of plants showing damage caused by insects, diseases, pests. D. Field trip to a local greenhouse and have manager point out diseases, insects and pests. E. Teacher demonstrates technique of fumigating for nematode control.		
	All activities mentioned above	Teacher will continually check plants as they mature, and again when they reach a saleable state.
A. Teacher demonstration-Show students how to prepare holiday crop plants for shipping. B. Use the overhead projector and outline the procedure to use. C. Field trip to a local nursery to observe their techniques D. Lecture and outline procedure on chalkboard E. Class discussion to bring out the correct procedure	Students prepare crop plants selected for marketing by . Grading, their crop plants . Labeling plant species . Adding decorative wraps-placing in shipping cartons	Students will demonstrate to the instructor in lab the correct procedure to use when preparing holiday crop plants for shipping.

MODULE OF INSTRUCTION

Title - GROWING SPECIALIZED GREENHOUSE HOLIDAY CROPS Code - 01.0503-03

RESOURCE MATERIALS

Books

Ball, G. P., The Ball Red Book, 12th Edition, IMS Stone Hall, Cornell University, Ithaca, New York 14850

Ball, G. P., Greenhouse Crop Production, IMS Stone Hall, Cornell University, Ithaca, New York 14850

Easter Lillies, IMS Stone Hall, Cornell University, Ithaca, New York 14850

Producing Poinsettias Commercially, IMS Stone Hall, Cornell University, Ithaca, N. Y. 14850

Bulletins

Growing Azaleas and Rhododendrons, Home and Garden Bulletin No. 71, U.S.D.A. Washington D.C.

Cut Tulips for Commercial Growers from Dry-Stored Pre-Cooled Bulbs, Extension Bulletin 1221, Extension Service, Cornell University, Ithaca, New York 14850

Filmstrips

Greenhouse and Related Structures, IMS Stone Hall, Cornell University, Ithac, New York 14850

Floriculture Crops -- IMS, Stone Hall, Cornell University, Ithaca, N. Y.

MODULE OF INSTRUCTION

Title - ORNAMENTAL HORTICULTURE - LANDSCAPE DESIGN Code - 01.0504-01

DESCRIPTION:

The module emphasizes the importance of using basic landscape principles to provide desirable settings for the private residence and large public and private facilities.

Students learn to use the common landscape symbols and read scales accurately to determine location of plant material in landscape settings. Basic design characteristics such as harmony, balance, and unity are used by students to develop landscape plans for the public, service, and private areas of a landscape setting.

In completing landscape plans, students check for characteristics such as repetition, overall design, theme and use of landscape structures such as fences, walks, and patios.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Reading landscape drawings and using basic design principles	2	6
2. Landscaping the private residence	1	6
3. Landscaping large properties	1	7
4. Completing the landscape plan	1	6
	5	25

Revised June, 1974

MODULE OF INSTRUCTION

Title - ORNAMENTAL HORTICULTURE - LANDSCAPE DESIGN

Code - 01.0504-01

OBJECTIVES to be obtained:

The student will be able to:

1. Explain verbally or in written form several important phases on the history and development of landscape design.
2. Given drawing equipment, and use scales to satisfaction of teacher.
3. Given samples of symbols used in landscape drawings, render the symbols to satisfaction of teacher.
4. Given outlines of plot plans, sketch design indicating understanding of basic design principles to satisfaction of instructor.
5. Given measurements and data of small residential property, make simple plot plan to satisfaction of teacher.
6. Given plot plan with landscape feature indicated, scale off measurements and stake out location of these features on the ground.
7. Given data regarding locations of trees, other features, locate these on plot plans.
8. Given plot plans, develop a design of the public area including features such as lawns, foundation plantings, walks and drives.
9. Given plot plans, design the service area giving consideration to lay out for practical use, screening and play areas.
10. A private area design is developed through use of screens, shaded areas and patios.
11. A recreation area is developed including features such as swimming pools, play areas, play equipment and game areas.
12. Given a plot plan, design the landscaping of a larger property taking into consideration factors such as overall design, required plant materials and costs.
13. A complete landscape plan is developed from a plot plan with consideration given to repetition, tying the area together, overall design and theme.

OBJECTIVES BY UNIT	**CONTENT**
1. Reading landscape drawings and using basic design principles. Objective #1 The student will explain verbally or in written form several important phases in the history and development of landscape design.	A. Introduction to landscape design. . What is landscape design . History, development, and importance . Current status and future trends . Uses of landscape plans . Kinds of design plans and models
Objective #2 Given drawing equipment student will measure and use scales to satisfaction of the instructor.	B. Landscape drawing techniques. . Materials needed . Lettering techniques . Form . Scales and measuring
Objective #3 Given samples of symbols used in landscape drawings, the student will draw the symbols to satisfaction of teacher.	C. Use of plant symbols in landscape design. . Evergreens . broadleaf . narrowleaf . Deciduous . trees . shrubs . Construction features . walls . fences . walks . Other symbols

Module ORNAMENTAL HORTICULTURE - LANDSCAPE DESIGN 01.0504-01

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
The teacher should prepare a set of transparencies with overlays for the overhead projector for this module. The National Landscape Institute home study program is a good reference.	Students, given outlines of landscape plans, sketch designs utilizing principles of design. Students develop designs incorporating areas approach utilizing principles of design.	Written or oral quiz on introduction to landscape design.
A. Distribute drawing materials. B. Using overhead projector, demonstrate lettering techniques, use of scales, proper form to use, how to measure.	Students practice lettering; practice measuring and use of scales; and use proper form.	Test students by having them draw an object to scale and letter it to industrial standards.
A handout should be prepared showing the accepted plant symbols to be used on student's drawings.	Students do assignment involving use of plant and construction symbols.	Students will draw and identify 20 landscape symbols to scale.

OBJECTIVES BY UNIT	CONTENT

Objective #4
Given outlines of plot plans, student will sketch designs indicating understanding of basic design principles to satisfaction of instructor.
	D. Understanding and using basic design principles.
	. Axial relationships
	. Harmony
	. Balance
	. Unity
	. The areas approach
	  . public
	  . service
	  . private
	  . recreation
	. Uses and development of
	  . retaining walls
	  . walls and fences (free standing)
	  . gates
	  . garden statuary
	  . hedges
	  . other garden features

Objective #5
Given measurements and data of small residential property, students will make simple plot plan to satisfaction of teacher.
	E. Making, using, and reading simple plot plans.
	. Reading plot plans
	. Laying-out plot plans
	. Using scale drawings
	. Locating:
	  . drives and walks
	  . shade trees
	  . ornamental trees
	  . enclosures
	  . other garden features

Module ORNAMENTAL HORTICULTURE - LANDSCAPE DESIGN 01.0504-01

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
Develop concepts of design principles utilizing overlays on overhead projector.	Students design plans including landscape features.	Give students a plot plan and have them locate and label all features.
Students orally interpret given plans before class. Class criticizes each student presentation.	A. Students, given measurements and data of small residential property, make simple plot plans. B. Students, given plot plan with features indicated, stake out positions of features on grounds. C. Students, given locations of trees, features, etc., are to locate these on plot plans.	Students should be evaluated according to their presentation of a set of plans before the class.

OBJECTIVES BY UNIT	CONTENT
Objective #6 Given plot plan with landscape feature indicated, student will scale off measurements and stake out location of these features on the grounds.	F. Locating landscape features by staking them out to scale. . Building . Areas . public . service . private . recreation
Objective #7 Given data regarding location of trees, other features, the student will locate these on plot plans.	G. Locating other features from the plan to scale. . Locating: . drives and walks . shade trees . ornamental trees . enclosures . other garden features
2. Landscaping the private residence Objective #8 Given plot plans, student will develop a design of the public area including features such as lawns, foundation plantings, walks and drives.	H. Landscaping the public area. . Lawns . Foundation plantings . Walks, drives, etc. . Specimen plants . Accent plants . Selecting plant materials . Making planting plans

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Lecture to help students get started by showing the proper procedure required. B. Demonstrate areas during lab. C. Have a student demonstrate locating one of the features for the class.	Students will be given stakes to locate features from the plan to 100% accuracy.	Students will be given lab practice to show their ability to stake out positions of features on grounds.
A. Demonstrate to students in lab by locating one of the features. B. Have a student locate one of the features for the rest of the class.	Students will be given stakes to locate features from the plan to 100% accuracy.	Students will be given lab practice to show their ability to stake out positions of features on grounds.
A. Provide handouts of duplicated material showing relative sizes of maturity of ornamental plants, outlines of plant shapes, list of hardy plants suitable for specific uses, criteria for selecting plants. B. Presentation of criteria for designs. C. Show slides of good and poor examples of designing.	Students, given plot plans, develop designs of public area.	Students will be given a plot plan to test their ability to locate and label all features for the public area.

OBJECTIVES BY UNIT	CONTENT
Objective #9 Given plot plans, the student will design the service area giving consideration to layout for practical use, screening and play areas.	I. Landscaping the service area. . Laying-out for practical use . Screening . Play areas . Selecting plant materials
Objective #10 A private area design is developed through use of screens, shaded areas and patios.	J. Landscaping the private area. . Laying-out for practical use . Laying-out for beauty . Screening . Focal points and axes . Shading . Patios, terraces and secluded areas . Specimen plants . Selecting plant materials
Objective #11 A recreation area is developed including features such as swimming pools, play areas, play equipment and game areas.	K. Landscaping the recreation area. . Picnic and barbecue areas . Play equipment . Play areas . Swimming pools . Laying-out game areas . Selecting plant materials

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
Describe functions of service area. Provide lists of plants available for this function.	Students, given plot plans, develop designs of service areas.	Students will be given a plot plan to test their ability to locate and label all features for the service area.
A. Use overlays on overhead projector to develop concepts. B. Show slides of good and poor examples of landscaping private area. C. Provide handouts of lists of suitable plant materials.	Students, given plot plans, design landscaping of private areas.	Students will be given a plot plan to test their ability to locate and label all features for the private area.
Show slides of representative items included in recreation area.	Given plot plans, students design recreation area.	Students will be given a plot plan to test their ability to locate and label all features for the recreation area.

OBJECTIVES BY UNIT	CONTENT
3. Landscaping large properties Objective #12 Given a plot plan, the student will design the landscaping of a larger property taking into consideration factors such as overall design, required plant materials and costs.	L. Landscaping larger properties. . Principles of design for larger properties . Selecting plant materials . Calculating costs of the job . Using specifications
4. Completing Landscape Plan Objective #13 A complete landscape plan is developed from a plot plan with consideration given to **repetition,** tying the area together, overall design and theme.	M. Completing the landscape plan. . Repetition . Tying the areas together . Overall design . Theme . Using landscape structures • fences • walls • walks • patios • terraces • other structures

Module ORNAMENTAL HORTICULTURE - LANDSCAPE DESIGN 01.0504-01

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A . Point out similarities and differences of designing for larger properties. Because of increase in scale of planting, larger plant material is appropriate. B . Grounds maintenance, June 1967 - Planting for Public Buildings and Commercial Properties - slide series.	Given plot plan, students design landscaping of larger areas.	Given a plot plan, have students estimate cost of materials and locate all features to scale.
Develop concept of repetition. Avoid using too many kinds at home. Develop unified theme. Incorporate landscape features into theme.	Given plot plan, students design landscaping of entire property.	Students should hand in a complete landscaped plan of their own property or a given plot plan.

MODULE OF INSTRUCTION

Title - ORNAMENTAL HORTICULTURE - LANDSCAPE DESIGN Code - 01.0504-01

RESOURCE MATERIALS

Books -

National Landscape Institute - Home Course - Los Angeles, California.

Bulletins -

American Association of Nurserymen, Inc., Washington, D.C. - The Standard For Home Landscaping. $.25 per copy.

IMS - Cornell Extension Bulletin - Cornell University, Stone Hall, Ithaca, N.Y. - Trees For the Home Grounds #1096. $.05.

Refer to IMS Catalog - for selected teaching references and aids for landscaping - Cornell University, NYS College of Agriculture, Stone, Hall, Ithaca.

Periodicals -

Grounds Maintenance, Kansas City, Mo,, June 1967. "A Guide to Landscape Job Estimating. American Nurserymen - monthly publication.

Audiovisuals -

1. Basic Techniques for Home Landscaping. 16 mm color and sound film. 11 1/2 min. Film Bookings, Motion Picture Service, USDA, Washington, D.C. 20250.
2. Plantings for Public Buildings and Commercial Properties. Slide series and script. IMS, 201 Stone Hall, Cornell University, Ithaca, N.Y. 14850.
3. Foundation Plantings. Slide series (24) IMS, Cornell Film Library - Cornell University, Ithaca. $.30 per day.
4. Landscaping for the Future. 16 mm sound color, 14 min. $2.50.
5. Landscaping the Home Grounds. Slide series and script. Agricultural Education, Curriculum Materials, Room 201, 2120 Fyffe Road, Columbus, Ohio 43210.

RESOURCE MATERIALS

Audiovisuals (cont'd) -

6. Tries for Landscaping, Identification, Culture, Use. (Aydex 275) Agricultural Education, Columbus, Ohio 43210.

7. Shrubs for Landscaping, Identification, Culture, Use. (Aydex 276) Agricultural Education, Columbus, Ohio 43210.

8. New Guidelines for the Well-Landscaped Home (USBA). 16 mm sound color, 14 min. $1.50 (IMS - Cornell Film Library - Cornell University, Ithaca, N.Y.

MODULE OF INSTRUCTION

Title - LANDSCAPE CONSTRUCTION FEATURES

Code - 01.0504-02

DESCRIPTION:

Students will use concrete and asphalt working tools to construct various landscape features. Features to be developed are: patios, edgings, retaining walls, free standing walls and steps. Each feature will be constructed of a different material so the student will gain a degree of proficiency in using concrete, asphalt, gravel, natural stone, brick, flagstone, and cement block. Emphasis will also be given to purchasing procedures for materials and tools.

DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Concrete Edging	½	2
2. Asphalt Walkway Construction	½	2
3. Stone Dry Wall Construction	1	6
4. Flagstone Patio Construction	1	3
5. Stair Construction	1	6
6. Free Standing Wall Construction	1	6
	5	25

Revised June, 1974

MODULE OF INSTRUCTION

Title - LANDSCAPE CONSTRUCTION FEATURES

Code - 01.0504-02

OBJECTIVES to be obtained:
The student will be able to:

1. Student will prepare a form for concrete edging, mix and pour concrete, finish and remove the form to the satisfaction of the instructor.
2. The student will construct a 10' x 3' section of asphalt walkway preparing base, forms, and laying asphalt.
3. Each student will lay out, prepare a base for, and construct a stone dry wall.
4. The student will be able to construct a flagstone patio according to specified plans.
5. Using forms and ready mixed concrete or dry pre-mixed concrete materials, the student will construct steps for various landscape setting.
6. Each student will construct a section of free standing wall by preparing footings, mixing mortar and placing blocks.

01.0504-02

Title - LANDSCAPE CONSTRUCTION FEATURES

OBJECTIVES BY UNIT	CONTENT
Unit 1. Objective #1 Student will prepare a form for concrete edging, mix and pour concrete, finish and remove the form to the satisfaction of the instructor.	A. Laying out forms according to plans . Choice of form materials . Leveling and setting forms B. Pouring concrete in forms . Hand mixing of concrete and pouring (estimating quantities) . Using ready-mix C. Floating and finishing concrete . Use of floating board . Use of edging tools . Texture finishes . Removal of forms
Unit 2, Objective #2 The student will construct a 10' x 3' section of asphalt walkway preparing base, form, and laying asphalt.	A. Preparation of bearing surface for asphalt . Use of gravel . Preparing drain where necessary B. Construction of forms for asphalt . Size of form . Materials used in form C. Laying asphalt . Uniformity of application - depth . Proper smoothing of material (tamping and rolling)

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Demonstration: The process of cutting and setting forms is shown to students. Use of hand level and string guide is demonstrated. The instructor should prepare in advance a plan detailing the use of concrete edging. Students should follow instructor in a 15 minute demonstration on the process of determining quantities of form materials and concrete. A sample of correctly set forms should be available for students to view.	Each student participates in the construction of a section of concrete edging acquiring the following skills: . Estimating quantities of materials . Setting up forms . Pouring concrete . Finishing surface of edging . Removal of forms	The instructor prepares a checklist of skills that student should acquire in the student application activity. The evaluation is conducted using the instructor's sample of concrete edging as the standard.
Prepare in advance of unit a section of asphalt walkway demonstrating construction techniques. Leave part of walkway incomplete so base, forms, and properly laid asphalt are apparent to students.	Each student will prepare ground, set forms and lay asphalt for a 10' x 3' section of walkway.	Student will be evaluated according to standard section of sidewalk prepared by instructor. A checklist of student skill accomplishments should be kept in the following areas: . Adequate preparation of bearing surface areas insuring adequate drainage and resistance to break up under heavy loading. . Placement of forms to comply with specified widths and depths and withstand pressure of loading. . Asphalt application is uniform and wearing surface is finished according to specifications

Title - LANDSCAPE CONSTRUCTION FEATURES

OBJECTIVES BY UNIT	CONTENT
Unit 3, Objective #3 Each student will layout, prepare a base for and construct a stone dry wall.	A. Preparation of base for dry wall . Base drainage should be away from wall . Where insufficient drainage exists, installation of drainage tile is necessary . Sub-grade soil should be compacted prior to laying up stone B. Construction of dry wall . Largest stones are used at base of wall . Size of stones should become smaller toward top of wall . Wall should slant towards back at the rate of 2" per foot of wall height . Dry wall heights should be limited to a maximum height of about 4'-5' depending on soil conditions
Unit 4, Objective #4 The student will be able to construct a flagstone patio according to specified plans.	A. The area for the patio is properly staked out and prepared for the pouring of concrete. . The patio area is located according to plot plan . The area for patio is excavated to at least 4" to accommodate forms and concrete . Form boards are placed according to dimensions in plot plan . Reinforcing rods are used where surface areas require extra strength B. Concrete pouring and setting of flagstone C. Setting of flagstone in sand base . Setting stone level with prevailing grade

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES

Using the school land laboratory the instructor should demonstrate proper construction of dry walls by:
. Preparing the subsoil base
. Laying up a 2'x2' section of the dry wall for students to observe construction techniques
	Following demonstration of the instructor, each student will construct a 2' x 2' section of dry wall utilizing following tools and materials:
	. Tools
	  . shovels
	  . line level
	  . plumb line
	. Materials
	  . assorted stone various sizes
	  . drainage tile
		Student should be evaluated on following skills:
		. Base preparation is adequate for prevailing drainage and wall size
		. Stones for wall grade from largest at low level to smallest at top of wall
		. Wall tapers at about 2" per foot of vertical wall height.

In small groups the teacher demonstrates preparation of site for a patio. Student should observe the process of setting flagstone both in concrete and in building sand.	During the laboratory period each student should participate in preparation of site and laying of flagstone for a patio. This activity could be conducted on the school land lab or possibly be a part of a community improvement project in a town park, etc.	Students should be evaluated on: . The ability to lay out patio according to plans . Adequate preparation of site before laying of flagstone, this includes the addition of concrete or sand . Manner in which the flagstone has been laid. Edges should be level with prevailing grade A checklist of each skill could serve as a record of student accomplishment of each activity.

Title - LANDSCAPE CONSTRUCTION FEATURES

OBJECTIVES BY UNIT	CONTENT
Unit 5, Objective #5 Using form and ready mixed concrete or pre-mixed concrete materials the student will construct steps for various landscape settings.	A. Soil under location where steps are to be constructed is well drained and tamped . Where poor drainage exists a layer of cinders or gravel should be placed underneath the proposed steps . The site should be thoroughly tamped to prevent unwanted settling after step construction B. Step forms are constructed to accommodate grade that is to be scaled . 4" concrete slab is poured under steps . Pitch of steps is determined by pitch board . Average rise of steps is 7" while tread width is 10" . Install cut-out stringers and risers C. Pouring concrete in forms . Check to be sure all wearing surfaces are properly floated . Vibrate to remove air from fresh concrete
Unit 6, Objective #6 Each student will construct a section of free standing wall by preparing footings, mixing mortar and placing blocks.	A. Footings are located according to plot plan and forms are placed . Wall footings should be 10" to 12" deep and extend no more that 4" beyond each side of the wall . Where soil is not firm enough construction of forms is necessary. Forms should be adequately reinforced and be leveled for accurate wall location B. Concrete for footings is poured C. Corners of footing are located and blocks are laid out from corners . All blocks are laid with thicker end of face shell up . Alignment of block is frequently checked . Block grade, level are checked and blocks are made plumb

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
The instructor or a masonry instructor should demonstrate standard techniques used in site preparation and form construction. This unit may most effectively be handled at the time the masonry instructor is beginning instruction in basic step construction	Students may be involved in a group project of constructing a set of stairs as a permanent landscape feature on the school land lab. As an alternative a small group of students could be scheduled with the masonry instructor on a rotating basis to acquire the basic skills necessary in step construction.	Each student should be given a checklist of skills that they can acquire in this unit. Skills would include: . Site preparation . Form layout . Form construction . Laying of concrete and finishing . Proper crowning of concrete and removal of forms
The instructor prepares a demonstration of free standing wall construction in the necessary shop or land lab. The process of laying block including: . Leveling . Making plumb . Producing clean joints is demonstrated for students	Each student will have the opportunity to lay up block in a free standing wall. Activities should include: . Preparation for footing . Installing footing form where necessary . Pouring footing . Stringing out block to check layout without use of mortar . Applying full mortar bed to footing . Laying block checking for level and plumb of wall	Following wall construction each students work should be checked for: . Size specification in relation to original plan . Footings conform to wall size requirements . Concrete wall is straight and true

MODULE OF INSTRUCTION

Title - LANDSCAPE CONSTRUCTION FEATURES

Code - 01.0504-02

RESOURCE MATERIALS

Books:

Landscape Maintenance and Establishment; The Pennsylvania State University, College of Agriculture, Department of Ag Education, University Park, Pennsylvania. Teacher education service, Volume 9, Number 2 - 1968.

Bulletins:

1. Recommended Practices for Laying Block. Portland Cement Association, Old Orchard Road, Skokie, Illinois 60076.

2. Suggested Unit Courses in Concrete Form Construction. Delmar Publishers, Inc., Albany, N. Y.

3. Bricklaying Vocational Training by Structural Clay Production Institute, 1750 Old Meadow Road, McLean, Virginia 22101.

MODULE OF INSTRUCTION

Title - INDOOR LANDSCAPING Code - 01.0504-03

DESCRIPTION:

This module involves students in the review of the overall indoor landscape plan to provide information for selecting planters and plantings.

Students will assess the overall growing conditions that exist where plantings are made. Measurements will be made on light availability, temperature and humidity conditons.

Emphasis is placed on the process of planting indoor herbaceous plants to produce a pleasing grouping of plant material. Students enrolled in the module develop skills in using various types of mulches and additional ornamentation to the landscape planting providing added interest.

Laboratory activities such as landscaping and preparation for shopping malls and planting take place in similar locations that have large enclosed areas with extensive indoor landscaping.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Selecting indoor landscape containers for various planting situations.	2	8
2. Planting indoor plants in landscape settings according to landscape plans, plant growth characteristics and related factors.	3	17
	5	25

Revised June, 1974

MODULE OF INSTRUCTION

Title - INDOOR LANDSCAPING

Code - 01.0504-03

OBJECTIVES to be obtained:

The student will be able to:

1. Select type and size of planter for a specific area to be landscaped. The selection is to meet established standards for interior design theme and size requirements.
2. Select type of plants suitable for a given indoor landscape based on factors such as cost, temperature, light requirements and overall design theme.
3. Design an attractive layout of plants giving consideration to balance and rhythm for a specific area to be landscaped. The layout must meet standards of the industry.
4. Measure lighting conditions, necessary for optimum growth of plants in a given indoor planter.
5. Given a specific indoor planter calculate the costs of planting and maintenance.

Title - INDOOR LANDSCAPING

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Selecting indoor landscape containers for various planting situations. Objective #1 The student will be able to select type and size of planter for a specific area to be landscaped. The selection is to meet established standards for interior design theme and size requirements.	A. Uses in: . Home . Office . Schools . Shopping Malls B. Types: . Wood . Ceramic . Mobile . Permanent
Objective #2 Students will be able to select type of plants suitable for a given indoor landscape based on factors such as cost, temperature, light requirements and overall design theme.	A. Varieties of plants. B. Addition of ornamentation. C. Purpose and use of marble chips and other decorative soil covers.

EDUCATION

01.0504-03 - Code

INDOOR LANDSCAPING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Reference NJ Ext. 327 Cornell Ext. E 1087 C. Field trip to indoor landscaped area D. Class discussion covering field trip E. Teacher made slides of unusual indoor plantings.	A. Determining necessary size of planters for specific area. B. Selection of types of planter for specific area. C. Field trip to indoor shopping mall, schools, business office complex for purpose of identifying types of planters used in indoor landscaping. Students to take notes on types and measurements of various planters.	A. For a specific entrance area, a planter of appropriate size is selected by students. Student selection is based on interior design theme and size requirements.
A. Lecture and discussion of reference NJ Ext. 327. Cornell Ext. E 1087 B. Field trip and lecture by owner of greenhouse specializing in plants for indoor landscaping. C. Class discussion D. Teacher made slides for purpose of plant identification of plants used in indoor landscaping. E. Discussion of wholesale plant costs and uses by guest speaker.	A. Identification of plants used in indoor landscaping. B. Arrangement of plants in planters for rhythm and balance. C. Selection of plants for specific areas. D. How to plant plants in indoor planters. E. Identification of specific areas where soil covering materials should be used. F. Figuring costs of planting plants given wholesale cost of plants and materials. G. Field trip for purpose of plant identification and artistic arrangements of plants. H. Planting of planters.	B. Students select plants for a 6' X 12' planter to be used in a shopping mall area. Factors such as cost, temperature, light requirements and design theme are considered by students.

01.0504-03

Title - INDOOR LANDSCAPING

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Planting indoor plants in landscape settings according to landscape plans, plant growth characteristics and related factors. Objective #3 The student will be able to design an attractive layout of plants giving consideration to balance and rhythm for a specific area to be landscaped.	A. Methods of creating rhythm and balance B. Enhancing overall interior design theme
Objective #4 The students will be able to measure lighting conditions necessary for optimum growth of plants in a given indoor planter.	A. Natural light B. Artificial light C. Use of light meters
Objective #5 Given a specific indoor planter, the student will be able to calculate the costs of planting and maintenance.	A. Labor and wage scale B. Cost of materials C. % profit in maintenance

01.0504-03 - Code

INDOOR LANDSCAPING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Use laboratory to set up several indoor landscape themes.	A. Individual students set up an indoor landscape theme developing skills demonstrated by instructor. B. Students take field trip to nearby malls and offices to observe interior landscaping programs.	A. Each student is given plant materials required for a given indoor planter area. Students set plants out to produce desired texture for area landscaped.
A. Lecture and discussion of light requirements of indoor landscaping - Reference NJ Ext. 327 Cornell Ext. E 1087 B. Demonstration of effect and use of spot lights in indoor landscaping.	A. Use of light meter. B. Identification of areas requiring use of artificial light. C. How to use spot lights for unusual effects. D. Field trip used for purpose of students figuring foot candles of light available at various indoor landscaping thru use of light meter.	B. Students will be able to measure accurately available foot candles of light in specific areas through use of a light meter.
A. Guest speaker discussing local labor situation and wage scale. B. Lecture and discussion cost of materials from suppliers. C. Method of figuring mark ups to produce profit.	A. Ability to figure costs of materials used for maintenance. B. Given specific wage scale student can figure labor costs for maintenance. C. In a given problem student can figure % profit for maintenance. D. Timing of maintenance procedure for classroom planter and recording materials used.	C. Given a particular planting situation students will be able to accurately figure costs of planting and maintenance charges.

MODULE OF INSTRUCTION

Title - INDOOR LANDSCAPING Code - 01.0504-03

RESOURCE MATERIALS

A. Books - Ball Red Book - George Ball Inc., West Chicago, Illinois 1965 - $2

Gardening In Containers, Sunset Book Series, Meulo Book Co., Meulo, California - $1.95

B. Bulletins -

- New Jersey Ext. Bulletin #327 - "Foliage Plants for Interiors" - $.25
- Cornell Ext. E1087 - "Artificial Lighting for Decorative Plants"
- Florida Experiment Station - Bulletin 746 - "Using Florida Grown Foliage Plants" - October 1971 - by C.A. Conover, T.J. Sheehan, and D.B. McConnell
- "Landscaping in Containers Without Natural Drainage" - Pub. AXT - 124- April 1964 - Sources: University of California, Ag Extension Service, 207 University Hall, Berkley, California 94720

C. Periodicals -

American Nurseryman - American Nurserymen Publishing Co.,
343 South Dearborn Street, Chicago, Illinois 60604

D. Audiovisuals -

Teacher made slides -

- Planters and Indoor Landscaping
- Plants for Indoor Planters
- Selection and Care of House Plants - Slide Set FL11 - Cornell Film Library - $.30 per day - 24 slides
- Decorative Use of House Plants - Slide Set FL16 - Cornell Film Library - $.30 per day - 23 slides

MODULE OF INSTRUCTION

Title - IDENTIFYING AND USING INDOOR FOLIAGE PLANTS Code - 01.0504-04

DESCRIPTION:

Students enrolled in this module will develop skills in selection of common indoor foliage plants for both large landscape settings and small dish gardens.

Student selection of plant material is based on specific characteristics of indoor plants such as leaf arrangement, size and shape of plant, color, temperature and light requirements.

In the process of selecting plant materials to be used in various indoor landscape settings students will develop the skills required to select a grouping of plant materials that would be suitable for a specific set of indoor growing conditions.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Identifying and using specimen plants	2	13
2. Use and common characteristics of dish garden plants.	2	13
	4	26

Revised June, 1974

MODULE OF INSTRUCTION

Title - IDENTIFYING AND USING INDOOR FOLIAGE PLANTS

Code - 01.0504-04

OBJECTIVES to be obtained:

The student will be able to:

1. Identify by sight the common and botanical names of 15 large specimen plants.
2. Identify common and botanical names of 15 varieties of dish garden plants.
3. Assemble a dish garden selecting 5 different plant varieties that will accent dish garden theme.
4. Specimen plants will be selected for specific locations by students using factors such as available light, humidity, temperature and overall appearance to determine plant materials used.
5. To combine in a common container or area (planter) a variety of different foliage plants that are compatable in growth habit, lighting requirements and soil conditions, to obtain a predetermined effect.

Title - IDENTIFYING AND USING INDOOR FOLIAGE PLANTS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identifying and using specimen plants Objective #1 To identify by sight the common and botanical names of 15 large specimen plants.	A. 15 specimen plants B. Common names C. Botanical names D. Characteristics typical of particular species i.e. slits in leaves, number of lobes on leaf.
Objective #2 Students will be able to identify common and botanical names of 15 varieties of dish garden plants.	A. 15 specimen plants B. Common names C. Botanical names D. Characteristics typical of particular species E. Habits of growth
Unit 2 - Use and common characteristics of dish garden plants. Objective #3 Students will assemble a dish garden selecting 5 different plant varieties that will accent dish garden theme.	A. Selection of containers B. Selection of plants C. Coordinating plants to container D. Compatibility of plants

01.0504-04 - Code

IDENTIFYING AND USING FOLIAGE PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Have a specimen or picture available while discussing plants.	A. Associate a particular plant with its name. B. Have students make labels and label each plant.	A. Assemble 15 different large specimen plants and have students identify common and botanical names as well as distinguishing characteristics.
A. Have a specimen or picture available while discussing plants.	A. Associate a particular plant with its name. B. Have students make labels and label each plant.	A. From a group of 15 different dish garden plants, students can identify common and botanical names, growth habits and other distinguishing characteristics.
A. Put plants that are compatible with each other in groups. B. Discuss previously prepared dish gardens or pictures of dish gardens .	A. Selection of plants. B. Planting of small green plants. C. Arrange plants in a container D. Have students select one or more containers and practice planting dish gardens.	A. Students will assemble a dish garden from an assortment of dish garden plants and containers to create a specific effect.

01.0504-04

Title - IDENTIFYING AND USING INDOOR FOLIAGE PLANTS

OBJECTIVES BY UNIT	CONTENT
Objective #4 Specimen plants will be selected for specific locations by students using factors such as available light, humidity, temperature, and overall appearance to determine plant materials to be used.	A. Selection of typical specimens B. Size relationship C. Consideration of location
Objective #5 To combine in a common container or area (planter) a variety of different foliage plants that are compatible in growth habit, lighting requirements and soil conditions, to obtain a predetermined effect.	A. Area to be planted . Type of business carried on in building . Traffic pattern . Wishes of customer B. Selection of plant material . Background . Care required . Texture . Compatibility of plants . Cost consideration C. Planting technique

01.0504-04 - Code

IDENTIFYING AND USING INDOOR FOLIAGE PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Use pictures to make your point. Good examples are found in many advertisements and on T.V. shows i.e. Johnny Carson. B. Take a field trip to a building or business where specimen plants are used, i.e. Airports, Shopping Malls, Restaurants.	A. Determine how large specimen plants can be used. B. Using a particular area, office, classroom, hallway, have students decide what plants should be placed where. If plants are available, place the plants.	A. Selection of specimen plants for a specific office area is performed by each student. Factors such as size, light, temperatures, texture are to be considered by students.
	A. Handle plants. B. Laboratory activities may be the same as with using specimen plants. Except here all foliage plants applicable could be used.	A. Students select foliage plants for a specific shopping mall area with specified growth conditions.

MODULE OF INSTRUCTION

Title - IDENTIFYING AND USING INDOOR FOLIAGE PLANTS Code - 01.0504-04

RESOURCE MATERIALS

A. Books - Exotica 3, Graf, Alfred B., Florist Pub. Co., 343 So. Dearborn St., Chicago, Illinois 60604

Pronouncing Dictionary of Plant Names, 63 pages, Florist Publishing Co. 1967 (available through Cornell I.M.S.)

Growing Plants Indoors, 12 pages, Illinois, (Cornell I.M.S. catalog #53)

B. Bulletins -

Price list (Illustrated) - Vosters Nursery & Greenhouses Inc., Secane, Pa.

Selecting and Growing House Plants, 32 pages, USDA (available through Cornell I.M.S. - catalog #H78) $.20 per copy

Using Florida Grown Foliage Plants, 59 pages, (available through Cornell I.M.S. - catalog #H81) price $.40 per copy

C. Periodicals -

Florists Review, 343 So. Dearborn Street, Chicago, Illinois 60604

D. Audiovisuals -

MODULE OF INSTRUCTION

Title - IMPLEMENTING LANDSCAPE PLANTINGS　　Code - 01.0504-05

DESCRIPTION:

This module is designed so that the student will learn how to follow a landscape plan and actually establish the plant and structural materials on the site.

Students will prepare the location while they select, assemble and transport the materials to the site. Laboratory activities will take place in the school land lab or a private residence setting.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Identification of the symbols listed on a landscape plan	1	2
2. Location of trees and shrubs and circular, straight line and irregular shaped plant beds or landscape feature.	1	4
3. Identifying, selecting, assembling and transporting of landscape materials to a site.	1	2
4. Identification of soil constitutents needed to prepare a site for landscape planting.	1	1
5. Planting trees and shrubs	3	10
6. Preparing, planting and finishing plant beds	-	4
	7	23

Revised June, 1974

I

MODULE OF INSTRUCTION

Title - IMPLEMENTING LANDSCAPE PLANTINGS　　Code - 01.0504-05

OBJECTIVES to be obtained:
The student will be able to:

1. Given a landscape plan, the student will identify plant materials according to landscape plan specification.
2. Students locate trees and shrubs and circular, straight line and irregular shaped plant beds or landscape features to within 6" of landscape plan specification
3. Given a landscape plan, students will prepare a list of plant materials needed according to the proper size and shape.
4. Students will select and assemble the appropriate tools and equipment for transplanting, loading and unloading.
5. Students will identify soil constituents needed and use a ph. kit to test soil for acidity in order to prepare a site for landscape plantings.
6. Given plant materials, students will prepare and know how to protect them for transporting.
7. Given a tree or shrub, students will prepare a hole, taking in consideration the depth and width of the root system.
8. Students will backfill a tree or shrub after positioning it vertically.
9. Students will construct a catch basin that is 2 to 3 inches higher than the original level and exceeds the diameter of the shrub or tree.
10. Students will prune and support trees or shrubs with stakes and wire.
11. Students will prepare a plant bed by working soil to a depth of six inches while mixing the appropriate soil constituents into the soil.
12. Given plants, students will properly space them in the soil and cover the root systems without covering the plant beds.
13. Students will finish the plant bed by edging the borders to a depth of 2 to 3 inches and uniformly add a mulch with other decorative materials.

Module IMPLEMENTING LANDSCAPE PLANTINGS 01.0504-05

OBJECTIVES BY UNIT	CONTENT
1. Identification of symbols listed on landscape plans. Objective 1 . Given a landscape plan, the student will identify plant materials according to landscape plan specification.	A. Identify plant materials on a landscape plan. . Deciduous vs. evergreen . Trees, shrubs . Formal vs. informal . Ground cover area

EDUCATION

Module IMPLEMENTING LANDSCAPE PLANTINGS 01.0504-05

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Develop concepts of design principles utilizing overlays on overhead projector.	From actual landscape plans have students stake out plans to specification or visit an area being landscaped.	
B. Give students a set of plans and discuss	Students do assignments involving use of plant and construction symbols	
C. A handout should be prepared showing the accepted plant symbols to be used on student drawings, with stakes		
D. Layout a building to specifications and let class locate plant materials to within 6 inches.		
(Landscaping your home) Wm. R. Nelson, Jr. 1. p. 13		

OBJECTIVES BY UNIT	CONTENT
2. Location of trees and shrubs and circular, straight line and irregular shaped plant beds or landscape feature. Objective 2 • Location of trees and shrubs and circular, straight line and irregular shaped plant beds or landscape features to within 6" of landscape plan specification.	B. Locate plant materials or landscape features to within 6" of landscape plan specification. • Student reads scale on plan • Border of a circular bed • Straight line and L shaped features • Border of an irregular bed • Student locate trees according to plan
3. Identifying, selecting, assembling, and transporting materials. Objective 3 • Given a landscape plan, students will prepare a list of plant materials needed according to the proper size and shape.	A. Prepare a list of the following plant materials needed from a landscape plan. • Tree species • Ground covers • Planting vines B. Select the proper size and shape of plant materials needed. Appendix A [105] C. Prepare a list of the decorative and protective materials needed from a landscape plan.

Module IMPLEMENTING LANDSCAPE PLANTINGS 01.0504-

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDU
A. Overhead Projector - discuss symbols and scale of a landscape plan with class) B. Have students list the plant materials from plans under one of the following headings: . Narrow leafed evergreens (indicate height, spread and other characteristics). . Broad leafed evergreen . Deciduous shrub . Small trees . Ground covers . Hedges . Shade trees C. Discuss and demonstrate in lab the various decorative and protective materials available. D. Field trip to a local nursery Landscaping your home. Agdex 529, pp. 20-22. Landscape maintenance and establishment, p. 35 Landscape design, pp. 92-95	Have students order all materials necessary for a particular plan from catalogs.	

OBJECTIVES BY UNIT	CONTENT
3. Continued	
Objective 4 . Students will select and assemble the appropriate tools and equipment for transplanting, loading, and unloading.	A. Prepare a list of tools for transplanting, loading, and unloading. . Transplanting . hand tools . spades . rakes . hoes . hammer . wheelbarrow . stakes, twine, tree wrapping material . rules, tape, spirit level . fertilizer, peat moss, and mulch . Loading and unloading . tractor and wagon . backhoe
Objective 5 . Students will identify soil constituents needed and use a ph kit to test soil for acidity in order to prepare a site for landscape plantings.	A. Collect a composite sample of both the top soil and subsoil of a site. B. Determine ph of soil sample. C. Select and determine the appropriate amounts of soil constituents needed to correct either the acidity or alkalinity of the soil at a site. D. Determine soil types in a soil sample (i.e., sand, gravel, clay, loam). E. Select or determine the appropriate amounts of soil constituents needed to prepare a suitable growing media.

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Group discussion pertaining to what tools will be needed.	Have students operate all tools and equipment applicable.	
B. Lecture to group describing the proper technique and safety precautions when using the tools and equipment		
C. Use catalogs displaying the particular equipment		
D. An actual demonstration for each tool and piece of equipment		
E. Field trip to a nearby nursery.		
A. Discuss with group the proper technique for transporting plant materials	Students will prepare plant materials for transporting.	
B. Demonstrate the proper procedure for roping and wrapping		
C. Field trip to a local nursery.		

OBJECTIVES BY UNIT	CONTENT
4. Identification of soil constituents needed to prepare a site for landscape planting.	
Objective 6	
. Given plant materials student will prepare and know how to protect them for transporting.	A. Preparing evergreens for shipping by roping. . Protect branches from overlapping and rubbing . Wrap evergreens to prevent wind damage. B. Secure plant materials vertically. C. Some deciduous trees may be roped . Columnar . Pyramidal . Weeping

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Have students read pamphlet from Cornell (Soil Structure) and later discuss. B. Slide series (IMS Cornell) soil structure to show good and poor soil. C. Demonstrate to class . Taking a soil sample . Using the ph kit. . Dig a hole and illustrate soil profile . S ud bury test kit to test other soil constituents	Students will collect a soil sample for testing the acidity alkalinity, soil type, and then determine the appropriate amounts of soil constituents needed to prepare a suitable media.	

Module IMPLEMENTING LANDSCAPE PLANTINGS 01.0504-05

OBJECTIVES BY UNIT	CONTENT
5. Planting trees and shrubs	A. Time to plant
Objective 7 • Given a tree or shrub, students will prepare a hole, taking in consideration the depth and width of the root system.	B. Dig a hole for plating bareroot stock which is deeper and wider then the root system. . Depth a. 1½ times the depth of the root system of the shrub or tree. . Width a. should be at least twice the diameter of the root system.
Objective 8 • Students will backfill a tree or shrub after positioning it vertically.	A. Procedure when backfilling a hole – . Position tree or shrub vertically . Cut string and fold back burlap . Properly mix soil additives with the soil . Backfill the hole 2/3 the way on the plant root ball. . Tamp firmly . Water . Backfill soil to the original soil level . Water B. Staking trees . Types of guy wires and stakes . single stake - diameters less than 2 inche . three or four guy wires for trees 4 inches in diameter . cable or number 10 wire . support stake ½ the distance between the bottom branch and top of tree. . Newly transplanted trees should be staked to protect the plant from wind damage. . Large trees should be guyed after transplanting . Use rubber hose to prevent girdling.

EDUCATION

Module IMPLEMENTING LANDSCAPE PLANTINGS 01.0504-05

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Discuss proper procedure with class B. Demonstrate with a shrub or tree C. Field trip to local nursery (Chapter 6) Landscaping your home, Ohio State University. pp.47-56 Landscape maintenance and establishment, Penn. State pp.63-65	Students will dig a hole using the proper procedure for a tree or shrub to be transplanted.	
A. Lecture -- describing the proper procedure, step by step (draw up dittos) B. Demonstrate to class during lab C. Field trip to a local nursery D. Overlays on a transparency	The proper procedure will be followed when backfilling a tree or shrub.	

OBJECTIVES BY UNIT	CONTENT
5. Continued	
Objective 9	
. Students will construct a catch basin that is 2 to 3 inches higher than the original level and exceeds the diameter of the shrub or tree.	A. Prepare a saucer shaped basin to help direct water to the root system. . Mound the soil 2 to 3 inches high on the oute edge of hole. . Locate stakes outside of root zone and vertically . Cover basin with 2 to 3 inches of good mulch.
Objective 10	
. Students will prune and support trees or shrubs with stakes and wire. .	A. Procedure to follow when pruning and supporting a tree or shrub. . Pruning . cut off one-fourth to one-third of the lateral branches but keep the natural shape of the plant . prune shrub or tree to shape . Wrapping and staking trees . wrapping . winter winds . temperature . materials . plastic emulsion sprays . burlap . kraft paper . procedure . Trunk of the tree is usually wrapped by starting at the top and working down in the form of a spiral. . Strong string wrapped in opposite direction will hold in place . clean up area

EDUCATION

Module IMPLEMENTING LANDSCAPE PLANTINGS 01.0504-05

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Demonstrate to class during lab. B. Field trip to local nursery C. Landscape maintenance and establishment pp. 45-56	Students will construct a catch basin to the proper specifications	
A . Classroom discussion, pertaining to the importance of pruning and support a tree or shrub. B . An actual demonstration of all procedures. C . Field trip to a local nursery. D . Guest speaker from local nursery E . Slides	Students will prune, wrap, and stake trees during lab. or in the field.	

OBJECTIVES BY UNIT	CONTENT
6 . Preparing, planting and finishing plant beds Objective 11 . Students will prepare a plant bed by working soil to a depth of six inches while mixing the appropriate soil constituents into the soil.	A. Prepare the plant bed to a depth of 6 inches . Equipment . shovel . rake . hoe . wheelbarrow . tiller . Mix constituents with soil . fertilizer . lime . peat moss, etc. . Water
Objective 12 . Given plants, students will properly space them in the soil and cover the root systems without covering the plant buds.	A. Preparing a plant bed. . Planting ground covers . herbaceous . deciduous . spacing . depth . mulch . watering . Planting vines . spacing . depth . support . Planting herbaceous plants . annuals . bulbs . perennials

1

EDUCATION

Module IMPLEMENTING LANDSCAPE PLANTINGS 01.0504-05

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Laboratory — Demonstration B. Lecture — Importance of mixing the soil and constituents. C. Field trip to local nursery.	Have each student prepare a plant bed at home or school lab.	
A. Demonstrate in lab. B. Group discussion to relate students' experience at home or in the field C. Lecture to discuss the various types of plant beds D. Slides IMS Cornell. E. Guest speaker from a nursery or a Garden Club	Have each student plant as many different materials as possible.	

OBJECTIVES BY UNIT	CONTENT
6. Continued Objective 13 . Students will finish the plant bed by edging the borders to a depth of 2 to 3 inches and uniformly adding a mulch with other decorative materials.	Finishing the plant bed. A. Edging . Depth . Mulch . manure . peat moss . straw . sawdust . Equipment B. Decorative materials . Brick . Stone . Perlite

Module IMPLEMENTING LANDSCAPE PLANTINGS 01.0504-05

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Demonstrate during lab.	Have students finish this plant bed by edging and adding some decorative materials.	
B. Lecture describing the proper method of edging and tools used		
C. Slides		
D. Field trip to local nursery		

MODULE OF INSTRUCTION

Title - IMPLEMENTING LANDSCAPE PLANTINGS   Code - 01.0504-05

RESOURCE MATERIALS

BOOKS

American Standards for Nursery Stock — American Association of Nurserymen, 835 Southern Bldg., Washington, D.C.
Approved practices in Beautifying the Home Grounds — Hoover, The Interstate printers and publishers, 19-27 North Jackson St., Danville, Ill.
Landscape Planning —Meredith Publishing Co., 1716 Locust St., Des Moines, Iowa 618
61834
Landscaping for Modern Living — Lane Publishing Co., Menlo **Park,** California
Ground Maintenance Handbook — McGraw Hill Pub. Co., Princeton-Highstown Rd., High**ston,** N.J. 08520
Pruning Ornamental Trees and Shrubs
Accent on Annuals — IMS)
Pruning Shrubs)
Landscaping Your Home Ch 528)
Landscaping Your Home Ch 529)
Ornamental Evergreens) IMS, 201 Stone Hall, Cornell Univ.,
Ornamental Shrubs) N.Y. 14850
Landscape Maintenance and Establishment)
Transplanting Shade Trees)
Selecting Trees for Home Plantings)
Ground Covers and Manuals)
Landscape Manual, Agdex 272)

PERIODICALS

Grounds Maintenance, Kansas City, Mo., June 1967. "A Guide to landscape job estimating."
American Nurserymen - Monthly pub.
Horticulturist — Monthly publ.

AUDIOVISUALS

Slides

Liming acid soils — Same as below
Ornamental plants for institutional landscaping — slide series and script. IMS, 201 Stone Hall, Cornell Univ., Ithaca, N.Y. 20250.
Commonly used trees, shrubs, groundcovers and vines.

Films

New guide lines for the well landscaped home (U.S.D.A.) Cornell Film Library — Cornell Univ., Ithaca, N.Y. 14 min. $1.50.

MODULE OF INSTRUCTION

Title - MAINTAINING WOODYSHRUBS IN THE LANDSCAPE Code - 01.0504-06

DESCRIPTION:

Students will develop skills of pruning, fertilizing, cultivating and applying pesticides to woodyplants and small trees.

Equipment that students will be expected to operate include: pruning tools, sprayers, fertilizer broadcasters and cultivators. Much of the time will be spent in laboratory and on-site activities.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Pruning woodyshrubs	2	8
2. Fertilizing woodyshrubs	1	6
3. Cultivating woodyshrubs	1	4
4. Applying pesticides to woodyshrubs	2	6
	6	24

Revised June, 1974

MODULE OF INSTRUCTION

Title - MAINTAINING WOODY SHRUBS IN THE LANDSCAPE Code - 01.0504-06

OBJECTIVES to be obtained:

The student will be able to:

1. Develop skill of operating a pruning shear.
2. Develop skills of removing branches in order to develop an aesthetic looking tree.
3. Develop the skill of hand broadcasting fertilizer in high density shrub areas.
4. Develop the skill of liquid feeding a shrub or small tree.
5. Develop the skill of auger feeding a shrub or small tree.
6. Estimate the amount and type of fertilizer to use for given shrub conditions.
7. Develop the skill of operating a 4 prong cultivator.
8. Develop the skill of cultivator depth control and weed removal.
9. Develop the skill of mixing pesticides.
10. Develop the skill of applying pesticides according to material and manufacturer's specifications.

Module MAINTAINING WOODY SHRUBS IN THE LANDSCAPE 01.0504-06

OBJECTIVES BY UNIT	CONTENT
1. Pruning woodyshrubs. Objective #1 Student will develop skill of operating a pruning shear at an average rate of 15 cuts in 20 minutes. Objective #2 Students will develop the ability to remove branches from trees to shrubs to produce an aesthetically desirable shrub.	A. Hand pruners Scissor type B. Bushes - to remove cut branches C. Spring type rake - to rake out leaves and branches Instructional supplies - . Tree paint
2. Fertilizing woody shrubs. Objective #3 The student will develop skills in hand broadcasting. Objective #4 Students develop ability to liquid feed shrubs. Objective #5 Students develop the ability to auger feed shrubs. Objective #6 Students develop the ability to determine type and amount of fertilizer to use for given shrub plantings.	A. Fertilizer container B. Ross root feeder - liquid injector feeder C. Hand auger D. Electric drill auger Instructional supplies - fertilizer 5-10-5 for flowering shrubs 10-6-4 for foliage plants

EDUCATION

Module MAINTAINING WOODY SHRUBS IN THE LANDSCAPE 01.0504-06

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
The teacher will demonstrate the correct method of holding a pruner. The students will see where the cut should be made and be told why. All cuts over 1/2 inch will be painted. The area will be raked clean. Debris will be removed in a bushel.	A. Each student will prune two small shrubs or other appropriate shrubs. B. The students will clean the area of all debris from the shrubs.	A. The teacher will inspect the shrub for damage and poor cuts. B. Have student do additional cuts.
A. The teacher will demonstrate the hand broadcast method. The fertilizer will be spread uniformly (the amount to use will be 1 lb. of 5-10-5 per 1" of caliper or 2 lb. of 10-6-4.) B. The teacher will demonstrate the "Ross" root feeder attached to water hose. The water will dissolve a unit of soluble fertilizer and inject it about 18" into the ground. C. General rule of thumb. 5 holes in a circle per 1" of soluble fertilizer. D. The teacher will demonstrate the hand auger method dividing the feet into the holes.	A. The students will do each of the operations with the teacher observing. B. Care should be taken in using electric drill - double insulated or 3 wire system properly grounded.	A. Evaluation of results can only be seen the following year or later on in the summer. B. The plant should be in a vigorous healthy-growing condition.

Module MAINTAINING WOODY SHRUBS IN THE LANDSCAPE   01.0504-06

OBJECTIVES BY UNIT	**CONTENT**
3. Cultivating woodyshrubs. Objective #7 Students will develop ability to cultivate 20 sq' per 10 minute period with a four prong cultivator. Objective #8 Students will develop the skill of cultivator depth control and weed removal.	A. Four prong cultivator B. Bushel - to remove weeds and rocks other debris C. Leaf rake D. Pruners (hand) - to remove exposed roots
4. Applying pesticides to woodyshrubs. Objective #9 The student will develop the skills of mixing and applying pesticides. Objective #10 With a hand operated sprayer and a small power sprayer for our given equipment the mixture will take 10-12 minutes and the spraying of a 3' shrub, 2 minutes.	A. Small gasoline driven sprayer with gun B. Hand operated sprayers . Tank sprayer . Trombone sprayer C. Measure cup 1 quart D. Small scale - 25 lbs. capacity Instructional supplies . Wettable powder · "Sevin" 50% wp · Malathion solution - 50%

EDUCATION

Module MAINTAINING WOODY SHRUBS IN THE LANDSCAPE 01.0504-06

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. The teacher will demonstrate the correct method of cultivating, weed removal with the tool and light grading. B. Exposed roots can be removed when seen and debris removed with leaf rake.	The students will cultivate the shrub beds to the extent of about 20 sq ft. All operations will be conducted in this area.	A. The cultivated area will be clean level and not have soil mounded up around the shrub. B. Weeds should not come up for about four days. C. Weed root system should be completely shaken loose from soil.
A. The teacher will measure or weigh the material to be used. This material will be added to the required amount of water. While power sprayers generally have built-in agitators, mixture put into the hand sprayers must be hand mixed thoroughly. B. The teacher will demonstrate the spray texture by adjusting the nozzle. C. The teacher will show how to spray the underside of the plant and leaves. Complete saturation is necessary. Safety precautions must be explained.	A. Students will each mix a predetermined amount of spray material. All measured material must be shown to the teacher before added to the water. B. The students will complete the mixtures and in turn each is to try one of the sprayers.	A. The plant or practice subject must be thoroughly saturated with spray. B. All work will be within specified time limits.

MODULE OF INSTRUCTION

Title - MAINTAINING WOODY SHRUBS IN THE LANDSCAPE Code - 01.0504-06

RESOURCE MATERIALS

Books -

Landscape Maintenance and Establishment. Pennsylvania State University College of Agriculture University. Pennsylvania - Vol. 9 - Number 2+.

Diseases and Pests of Ornamental Plants. Pironne, Dodge and Pickett. 3rd Edition. Ronald Press, New York. 1960.

Grounds Maintenance Handbook. Wyman, D. Macmillan, New York. 1956.

Bulletins -

Pruning Handbook. The Brooklyn Botanic Gardens. Brooklyn, New York. $1.00.

MODULE OF INSTRUCTION

Title - IDENTIFICATION AND LANDSCAPE USE OF HERBACEOUS PLANTS

Code - 01.0504-07

DESCRIPTION:

This module provides instruction in the identification of annual and perennial herbaceous plants. Students are involved in identifying herbaceous plants in landscape settings where they are normally used. The common names of herbaceous plants such as day lily, oriental poppy and iris are used in plant identification work.

Included in the landscape use of herbaceous plants portion of the module are features such as design of plant beds and borders in relation to height and color of plant materials. Emphasis is placed on creating special effects with herbaceous plants such as depth, uniformity, formality and informality in landscape settings.

The herbaceous plant module involves students in proper planting procedures. Consideration is given to preparation of herbaceous plant beds and proper method of spacing and transplanting individual plants.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation	
	Class	Other
1. Identification of Herbaceous Plants	2	4
2. Landscape Use of Herbaceous Plants	2	4
3. Site Preparation	1	6
4. Planting, Tamping Soil and Watering of Herbaceous Plants	2	9
	7	23

Revised June, 1974

I

MODULE OF INSTRUCTION

Title - IDENTIFICATION AND LANDSCAPE USE OF HERBACEOUS PLANTS

Code - 01.0504-07

OBJECTIVES to be obtained:
The student will be able to:

1. Given a selection of the important outdoor perennial and annual herbaceous plants in his locality, the student will correctly identify, using the common name, 40 of these including chrysanthemum, delphinium, summer phlox, day lily, oriental poppy, iris, peony and annual bedding plants.

2. Given a collection of at least five seed catalogs, commercial seed growers charts and garden catalogs the student will be able to explain the use of these reference materials.

3. The student will be able to list at least 30 herbaceous plants used in herbaceous beds and borders. Given 3 landscape designs including herbaceous beds and borders the student will be able to distinguish between the formal and the informal beds/borders and will be able to give at least 4 advantages or disadvantages of each type of bed/border.

4. Given an outline of a landscape plan the student will be able to complete a drawing of a herbaceous flower bed or border in one lab session. References for sequence of blooms and illustrations of flowers will be provided.

5. Given a predesignated area of property the student will be able to physically survey this area of property and select an appropriate site for a herbaceous flower bed or border according to material covered in lecture notes.

6. Given a selected site the student will be able to prepare a bed for planting. The student will be able to perform a safety check on a rototiller according to the manufacturer's specifications and to uniformly prepare the bed to the correct depth as determined by the instructor. The student will be able to evenly distribute the soil conditioner and till into the soil as predesignated by the instructor.

7. Given a soil test list the student will be able to accurately test the soil according to the manual provided with the soil test list and fertilize according to the results of the soil test.

8. Given 3 perennial and 3 annual herbaceous plants the student will be able to accurately set these plants out, tamp the soil around the plant and water according to the instructor's instructions and industry standards.

Code - 01.0504-07

AGRICULTURAL

Title - IDENTIFICATION AND LANDSCAPE USE OF HERBACEOUS PLANTS

OBJECTIVES BY UNIT	CONTENT
1. Identification of Herbaceous Plants Objective 1 Given a selection of the important outdoor perennial and annual herbaceous plants in his locality, the student will correctly identify 40, using the common name.	A. Perennial • Definitions • Characteristics of each
Objective 2 Use of seed catalogs, commercial seed growers charts, and garden catalogs.	

EDUCATION

01.0504-07 - Code

IDENTIFICATION AND LANDSCAPE USE OF HERBACEOUS PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Define "herbaceous," "perennial" B. Show students living plants, illustrated charts from seed companies, teacher produced slides, and seed catalogs. C. Student fill out forms listing characteristics of each kind of plant studied. (Including height, color, habitat, and soil requirements). D. Quiz using living plants where possible, slides or color photographs, include definitions. E. Define "annual"	The student will label at least 50 herbaceous plants in the greenhouse or surrounding school property. Reference material such as a Wayside Garden Catalog may be used for this identification. (In labeling use only common names)	The student will be able to identify orally or in writing at least 40 herbaceous plants and define annual, biennial and perennial.
A. Teacher shows students labeled packs of plants from greenhouse; teacher produced slides; commercial seed catalogs; commercial seed growers charts. B. Students fill out forms listing characteristics of each kind of plant studies.	The student will use seed catalogs, commercial seed growers charts and garden catalogs to identify herbaceous plants.	The student will be able to explain orally or in writing, the use of seed catalogs, commercial seed growers charts and garden catalogs such as the Wayside Garden Catalog.

Code - 01.0504-07

A G R I C U L T U R A L

Title - IDENTIFICATION AND LANDSCAPE USE OF HERBACEOUS PLANTS

OBJECTIVES BY UNIT	CONTENT
2 . Landscape Use of Herbaceous Plants Objective 3 Given three landscape designs including herbaceous beds and borders the student will be able to distinguish between formal and informal beds/borders and give 4 advantages or disadvantages of each.	A . Design of beds and borders . Should blend with overall landscape design . Should stay within original design lines . Minimal use of spectacular colors (eg reds distract and disturb--not restful) . Use as facing and filler plants in landscape design B. Height--lower plants in front; hightest at back C. Color . Use sparingly . Form, texture, etc., take precedent over color . Gay in spring (reds and yellows) . Cool in summer (pastels) . Warm in fall (bronze) . Suit personal tastes of clients D. Depth illusion . Brights seem closer (in distance) . Soft gray, green, blues seem more distant(peaceful) E. Uniformity--like flowers in same conditions at same time F. Formality vs informality . Formality usually does not hold attention as long . Formality requires greater precision in planting . Informality can hold attention and interest . requires more study and practice to develop . plantings require less precision G. Edging . Formal gardens may have conspicuous edges . Informal gardens should have inconspicuous edges (not raised)
Objective 4 Given an outline of a landscape plan the student will be able to complete a drawing of a herbaceous flower bed or border in one lab session.	H. Shrubs in herbaceous borders . Often preferred to spot trees and shrubs within herbaceous beds . Evergreens (coniferous and evergreen) keep garden from being desolate in winter

E D U C A T I O N

01.0504-07 - Code

IDENTIFICATION AND LANDSCAPE USE OF HERBACEOUS PLANTS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A.Hand out duplicated material prepared by teacher of principles of designing with herbaceous materials. B.Use beds available on school grounds to show proper and/or improper use of herbaceous plants. C.Overhead projector to show examples of good design and proper use of different herbaceous plants. D.Hand out and go over chart showing relative size at maturity. (Ref.Geo.Ball Catalog,Wayside Gardens Catalog and other available references.) E.Pass out duplicated copies of bloom sequences of perennials, biennials and bulbs prepared by the teacher using available references. F.Using slides and illustrations from garden magazines the teacher will show examples of formal and informal gardens explaining the desirability of each. G.The instructor will explain advantages and disadvantages of formal and informal beds and borders, including architecture of buildings, present landscape, location of property,(country property vs city property) available maintenance and types of plants used.	A. The students in a panel discussion will discuss the informal bed/border vs the formal bed/border. This discussion will include such items as height, color, length of bloom,perennials, **biennials**, and annuals. B. The students will in one class hour write an essay explaining form, texture, depth illusion, uniformity as it applies to herbaceous beds and borders.	A. The student will list at least 25 herbaceous plants. B. The student will be able to distinguish between an informal bed/border and be able to list at least 3 advantages or disadvantages of each.
The instructor using the over head projector and the black board will show the students how to design a herbaceous flower bed. Consideration will be given to sequence of blooms, height, and color of bloom.	A. Given an outline of a landscape plan, the student is to complete drawing of herbaceous flower bed in one lab session. Student has sequence of bloom charts and illustrations of flowers as references. B. Given previously prepared sketch map of student's home grounds, he is to complete a drawing of a herbaceous flower bed in one lab session. Ref. as above. C. Given area of 100 sq. ft. on school grounds, student draw landscape plan utilizing flowers available from school greenhouse and draw plant list listing quantity of plants required.	The student given an outline of a landscape plan will complete a drawing of a herbaceous flower bed in one lab session. Student has sequence of bloom charts and illustrations of flowers as references.

OBJECTIVES BY UNIT	CONTENT
Objective 5 Selection of site for a herbaceous flower bed or border.	Selection of site for herbaceous flower bed. . The following considerations should be included in site selection . present landscape--do not over crowd . lay of the land--consider view from house or other building site being landscaped view from adjacent sites or roadways
3. Site Preparation Objective 6 Given a site the student will be able to prepare a bed for planting, etc.	Preparation of Bed . Soil preparation . all soil in site area should be thoroughly worked . addition of soil conditioning material to soil to insure proper drainage and texture. (Ref. Soils and Soil Fertility - Tillidale & Nelson, 1968)
Objective 7 Soil testing of site and site fertilization.	Fertilize soil according to soil test and types of plants being planted. Using a soil test kit such as a Sudsbury kit, determine present PH and adjust as necessary to give accurate PH for proposed plants.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
The teacher will explain the importance of site selection giving consideration to the present landscape, lay of the land, and adjacent properties, including highways and buildings.	The students in one class period will walk the school grounds and make an accurate sketch of existing buildings, landscape and adjacent property lines, including highways and view concealing buildings, towers, etc.	The student will select a site for a herbaceous bed giving consideration to the material covered in lecture notes as it applies to site selection.
A.Teacher demonstrates use of spade, rotary tiller, methods of incorporation of soil condition line or ferrous sulfate and fertilizer into soil. B.Teacher has samples of soil and conditioning materials such as vermiculite, perlite, pest moss, etc., for student examination. C.Students record amounts of conditioning materials commonly applied per sq yd of soil surface. Teacher reviews method of determining soil PH and quantity of lime or ferrous sulfate to apply to soil to adjust PH.	Correct use of spade, rotary tiller. . Preparation of bed . condition soil . addition of soil conditioning material to soil . determine PH and adjust as necessary . fertilize soil The students will fertilize soil according to the results given by the soil test.	A.The student will correctly perform a safety check of the rototiller according to manufacturer's specs. B.The student will thoroughly till the selected site to the depth predesignated by the instructor. C.The student will evenly distribute the soil conditioning material and till into the soil as predesignated. A.The student will test the soil according to the directions given in the soil kit manual. B.The student will uniformly distribute the correct amount of fertilizer on the bed as determined by the soil test.

OBJECTIVES BY UNIT	CONTENT
4. Planting, Tamping Soil and Watering of Herbaceous Plants Objective 8 Student will be able to accurately plant, tamp soil, and water three perennial and three annual herbaceous plants.	Planting A. Perennials . spacing-according to plan previously prepared by the student . division of perennial plants, cutting away dead roots and stalks . holes large enough to receive spread out roots (holes should be approx. 1/3 deeper than crown of roots and 1/3 wider than spread of roots). Plants should not be planted deeper than they were previously planted. . soil around plants should be thoroughly tamped after planting and watered thoroughly. B. Annuals . Spacing according to plan previously prepared by student . Hole large enough to receive roots of transplant

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A.Teacher demonstrates techniques of planting material. B.Teacher demonstrates techniques of transplanting annuals. C.The teacher will transplant at least two perennial plants according to the methods accepted by the industry, pointing out correct procedure vs incorrect procedure. D.Teacher will demonstrate the method of tamping soil around newly planted plants and the correct procedure for properly watering newly planted plants.	AThe students will plant at least two perennial and two annual plants according to the instructor's instructions and industry standards. BSuch things as size of hole, straightness of plant, tamping of soil around and watering of plant will be considered.	The student will plant at least one perennial and one annual plant according to industry standards.

MODULE OF INSTRUCTION

Title - IDENTIFICATION AND LANDSCAPE USE OF HERBACEOUS PLANTS

Code - 01.0504-07

RESOURCE MATERIALS

Books

Biles, Roy E. The Complete Illustrated Book of Garden Magic, J. G. Ferguson Publishing Co., Chicago. 1969. $9.95. Chapter 9.

Readers Digest Garden Book

Bulletins

Cornell Bulletin E 1070. Recommended Annual Flowers for New York State. (.10)
Cornell Bulletin E 1190. Sequence of Bloom of Perennials, Biennials, and Bulbs. (15)
George Ball, 1966. Accent on Annuals

Audiovisuals

Garden Flowers, Annuals - Part I - Slide film 601. 1969
K. N. Schamacher & R. L. Courson, Voc Agr State University of Illinois. $3.10.
Garden Flowers, Annuals - Part II - Slide film 602. 1969.
K. N. Schumacher & R. L. Courson. Voc Agr State University of Illinois, Urbana, Illinois. $3.10.

MODULE OF INSTRUCTION

Title - GROWING NURSERY PLANTS

Code - 01.0505-01

DESCRIPTION:

This module involves the preparation, layout and maintenance of nursery stock and growing areas. The nursery operations will include mechanical and chemical cultivation, fertilization, irrigation, spraying, pruning, and winter protection for nursery crops.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	 Other
1. Layout and planting stock	2	8
2. Cultural practices	5	10
3. Winter protection	1	4
	8	22

Revised June, 1974

I

MODULE OF INSTRUCTION

Title - GROWING NURSERY PLANTS Code - 01.0505-01

OBJECTIVES to be obtained:

The student will:

1. Develop the skill of measuring with a steel tape.
2. Develop the skill of setting up and sighting straight lines with a surveyor's level.
3. Use a planting chain.
4. Dig a proper size planting hole.
5. Set the plant in the hole.
6. Rake the soil around the plant to form a berm. The berm will hold water in place.
7. Water nursery stock correctly.
8. Install the cultivator unit.
9. Operate the tractor drawn cultivator in a straight line.
10. Apply a chemical weed control.
11. Lightly cultivate the chemical in.
12. Water in the chemical.
13. Measure out fertilizer.
14. Calibrate the cyclone spreader.
15. Push the cyclone spreader over a specified area.
16. Cultivate in the fertilizer.
17. Gauge an amount of water over a period of time.
18. Lay out aluminum irrigation pipe to cover a specified area.
19. Water plants by the hand method.
20. Measure out pesticides.
21. Apply spray with a large power sprayer.
22. Clean the sprayer.

MODULE OF INSTRUCTION

Title - GROWING NURSERY PLANTS Code - 01.0505-01

OBJECTIVES to be obtained:

The student will:

23. Prune small branches with a hand shear.
24. Rake all debris from the nursery area.
25. Apply anti-dessicants.
26. Be able to explain the need for a live screen.
27. Be able to construct a simple burlap screen.

Module GROWING NURSERY PLANTS 01.0505-01

OBJECTIVES BY UNIT	CONTENT
1. Layout and preparation of site. Objective #1 The students will develop the skill of measuring with a tape. Objective #2 The student will develop the skill of setting up and sighting straight lines with a surveyor's level and mark the distances with surveying pins.	A. The use of measuring devices . Tapes (steel) . Surveyor's level and rod . Surveying pins B. Soil preparation equipment . Tractor (30 hp size) . Subsoiler and 2 bottom plow . Disc harrow C. Spacing of shrubs . Planting chain (200' or 400') D. Soil preparation material . Instructional material . Fertilizer . Lime . Agricultural gypsum • peat moss - (organic matter)
2. Cultural practices. Objective #3 The student will use a planting chain. Objective #4 The student will develop the skill of digging a planting hole. Objective #5 The student will set plants in prepared hole.	A. Spacing shrubs . Planting chain (200'-400') B. Digging holes . Round or pointed shovels . rake excess soil to form water holding basin C. Irrigation . Water - hose or other irrigation system D. Instructional material . Soil conditioners and fertilizer . Peat moss (organic matter) . Lime or ag. gypsum . Fertilizer E. Plants for nursery . Shrubs or trees - less than 10'-12'

EDUCATION

Module GROWING NURSERY PLANTS 01.0505-01

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. The students will, at the direction of the teacher, mark out an appropriate area for the nursery. The chemicals and organic matter, applied at recommended amounts, can be disced in. B. The students will plow and disc the field and measure out rows according to the cultivation. C. The planting chain, is used as a straight line and plants marked. Each ring on the chain will be a hole for a plant. Marked spots will be dug.	The students will go through all the operation outlined in the teaching method using the school's land laboratory facility.	Field will be level, no clumps of soil and four corners of square or rectangle marked off. The first line will be ready for planting.
The teacher will have the students put the planting chain in place. A hole will be dug, by students, next to each marker. Into each hole will be placed a plant. The plant will be set in at the level where all roots are covered. The soil will be bermed up to form a basin to hold water. The plants will be watered till the basin is filled. *Note - If chemicals were not added during field prep, packet plant and mix chemicals with soil from hole. This mixture will go back into the hole around the plant.	A. Students will dig holes according to tractor cultivator spacing. B. The students will plant and water all plants.	A. Rows must be absolutely straight; all plants must be straight (vertically); all plants must be watered. B. A 200' row 30" apart. 3' high plants take about 2 hours to complete.

Module GROWING NURSERY PLANTS 01.0505-01

OBJECTIVES BY UNIT	CONTENT
Objective #6 The student will rake the soil around the plant to form a berm or basin to hold water. Objective #7 The student will water nursery stock correctly.	
Objective #8 The students will install the cultivator unit or separate units on a tractor. Objective #9 The students will operate the tractor drawn cultivator over the plants on two or more rows in a straight line at correct depth. The students will remove a cultivator from the tractor.	F. Install and operate with cultivator units . Cultivator unit . Separate units - mounted individually

Module GROWING NURSERY PLANTS 01.0505-01

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A student will demonstrate the installation and operation of the tractor drawn cultivator. The student will demonstrate use of cultivator in two rows. *Note - If separate units are to be installed 2 or more students will install the units.	Each student in turn will install the units and cultivate 2 or more rows.	All installations of units will take 10 minutes or less. All rows will be straight. No plants will be de-barked.

OBJECTIVES BY UNIT	**CONTENT**
Objective #10 The student will apply a chemical weed control, on established stock. Objective #11 The student will lightly cultivate the chemical into soil (modified tooth harrow.) Objective #12 The student will water in the chemical.	G. Application and working in . Cyclone spreader . Modified tooth harrow . very shallow depth . drag . Measure (cup) H. Material to be used - instructional material . Chemical weed control . teflan or simazine
Objective #13 The student will measure out the required amount of fertilizer according to plant nutrient requirement. Objective #14 The student will calibrate the spreader to apply correct number of pounds of material per 1000 square feet. Objective #15 The student will push the cyclone spreader over specified area and evenly apply materials to produce uniform plant growth.	I. Application and working in equipment . Cyclone spreader . Pail . Cultivator - tractor drawn J. Measure devices Scale - 100 lb. K. Material to be incorporated in soil - instructional supplies. . Fertilizer 10-6-4 5-10-5

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. The teacher will measure (according to manufacturer instructions) the amount of chemical to go down on a specific area. B. The teacher will apply the material with the spreader. Impress upon the students the importance of uniformity of application. "Simazine" is allowed to remain on top of soil after application. "Teflan" is lightly cultivated and watered into soil.	A. Each student will measure and apply the weed control chemicals. B. Each student will cultivate and water in chemical if necessary. C. Students also lightly cultivate and water in teflon weed control chemicals.	A. Almost no weeds will germinate. If large areas do, job was done incorrectly. B. Students must hand use and reapply chemicals.
A. The teacher will measure and load the spreader with fertilizer. B. The teacher will apply fertilizer over a specified area. C. The teacher will cultivate in the fertilizer. *Note - If the area is small, use the hand broadcast method applying fertilizer from a pail.	All students will load, fertilize, and cultivate as outlined in the teaching method.	Fertilizer must be uniformly spread. Burned areas indicate poor uniformity of fertilizer application.

AGRICULTURAL

Module GROWING NURSERY PLANTS

01.0505-01

OBJECTIVES BY UNIT	**CONTENT**
Objective #16 The student will cultivate in fertilizer.	
Objective #17 The students will measure the amount of water over a period of time. Objective #18 The students will lay out aluminum pipe w/water heads to completely cover area. Objective #19 The students will water, in plants, by hand method.	L. Portable irrigation equipment . Pulse heads and risers - . Aluminum pipe . Hose 3/4" . Water cans M. Water measuring device calibrated . Coffee type cans, or commercial rain gauge
Objective #20 The students will measure pesticides. Objective #21 The students will apply spray with a large power sprayer. Objective #22 The students will clean the sprayer.	N. Equipment to spray plants . Large power sprayer and gun O. Measure correct amounts of pesticides . Measure cup - 1 qt. P. Instructional supplies . Material to spray on plants to control diseases • pesticides

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A . The teacher will set a rain gauge, calibrated in 1" units, 6' from a sprinkler head. He will time how long it takes to fill container to 1". This method will work for a given situation. The teacher will layout a small area to be irrigated (with pipe) and show coverage. B . The teacher will also demonstrate hand watering methods, using hose and water can.	A. In teams of two the students will measure water in a specified time. They will set up a sprinkler layout to corner a specified area. Given such variables as water pressure, plant weight and wind direction and velocity. B. Each student will water by the hand method and use of sprinkler heads.	. Water coverage must overlap. . Ground should be soaked to a depth of 12".
A . The teacher will measure out the required amount of pesticide and add to water in sprayer. B . The teacher will start the sprayer and allow pressure to build up. C . The teacher will spray keeping variables such as wind direction and desired spray pattern in mind.	A. Each student will measure out pesticide and add to sprayer. B. Each student will spray taking into consideration wind direction and completely saturate the plants. C. The students will flush out the sprayer with clean water following use.	All plants will be saturated. Control will be effective.

OBJECTIVES BY UNIT	CONTENT
Objective #23 The students will prune small branches with a hand pruner. Objective #24 The students will prune large branches with a lopping shear. Objective #24 The students will rake all debris from nursery area.	Q. Equipment for pruning plants . Pruning shears . scissor type . Lopping shears . long handle scissor type R. To clean pruned material . Leaf or fan rake S. Instructional material . Material to reduce disease . true point
3. Winter protection Objective #25 The students will apply anti-**desiccant** Objective #26 The students will be able to explain the need for a live screen. Objective #27 The students will be able to construct a simple burlap screen.	A. Screening material . Roll burlap B. Chemical winter protection . Anti-dessicant C. Applicator of anti-**desiccant** . Hand sprayer

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. The teacher will demonstrate both methods of pruning. B. The teacher will demonstrate cleanup procedures following pruning operation.	Each student will prune with the different tools and then clean the area. Any cut over 1/2" will be pointed with tree point.	All cuts must be clean and not irregular in shape.
A. The teacher will spray anti-desiccant on plants obtaining complete coverage. B. The teacher will clean the hand sprayer in clean H_2O. C. The teacher will have 2 students stretch burlap between 2 posts to screen plants from winter wind.	A. Each student will mix according to manufacturer's directions a mixture of anti-desiccant He will then spray the plant completely. B. Two students, in turn, will construct a burlap screen.	A. Plants must be saturated. B. Screen must be tight and secure.

MODULE OF INSTRUCTION

Title - GROWING NURSERY PLANTS Code - 01.0505-01

RESOURCE MATERIALS

Books -

American Standards for Nursery Stock. American Association of Nurserymen, Inc., 835 Southern Building, Washington, D.C.

Nursery Production and Landscape Maintenance. Robinson, William A., and others. Department of Agricultural Education, College of Agriculture, the Pennsylvania State University. University Park, Pennsylvania.

Bulletins -

Trees, Shrubs and Vines. Bulletin No. 43, College of Forestry, Syracuse University. Syracuse 10, New York.

MODULE OF INSTRUCTION

Title - ASEXUAL PLANT PROPAGATION Code - 01.0505-02

DESCRIPTION:

The student will be able to propagate woody plants, perennials and foliage plants using common asexual techniques.

Cuttings, division, separation, layering and grafting are included. The student will perform each of the above-mentioned operations in plant propagation.

MAJOR DIVISIONS OR UNITS OF CONTENT

	Time Allocations	
	Class	Other
1. Cuttings		
. Herbaceous stem cuttings	1	1
. Leaf cuttings	1	1
. Leaf bud buttings	1	1
. Root cuttings	1	1
. Soft wood cuttings	1	1
. Semi-hardwood cuttings	1	1
. Hardwood cuttings	1	3
2. Division		1
3. Separation		1
4. Layerage	1	5
5. Graftage	1	5
	9	21

Revised June 1974

MODULE OF INSTRUCTION

Title - ASEXUAL PLANT PROPAGATION   Code - 01.0505-02

OBJECTIVES to be obtained:

The student will:

1. Correctly make the following types of cuttings correctly, herbaceous stem cuttings, leaf cuttings, leaf bud cuttings, root cuttings, softwood cuttings, semi-hardwood cuttings, and hardwood cuttings.
2. Maintain conditions necessary for good and rapid rooting of cuttings mentioned in objective number one.
3. State on a written or oral quiz for each type of cutting mentioned above the name of at least one plant that can be propagated by each method.
4. Successfully propagate, in class, plants by division.
5. List on a written or oral quiz at least one plant that can be propagated by division.
6. Successfully propagate plants, in class, by separation.
7. State on a written or oral quiz at least three plants that can be propagated by separation and the plant structures.
8. Successfully propagate plants by tip-layering, simple layering, serpentine layering, mound layering, and air layering in class.
9. State on a written or oral quiz, for each type of layering mentioned above the name of at least one plant that can be propagated by each.
10. State on a written or oral quiz what three conditions largely determines the failure or success of each graft.
11. State on a written or oral quiz what is meant by bench grafting.
12. Propagate plants by graftage with at least 75% success.

Code - 01.0505-02

Title - **ASEXUAL PLANT PROPAGATION**

OBJECTIVES BY UNIT	CONTENT
Unit 1. - Cuttings Objective #1 - Each student will make the following types of cuttings correctly: herbaceous, stem cuttings, leaf cuttings, leaf bud cuttings, root cuttings, softwood cuttings, semi-hardwood cuttings, and hardwood cuttings.	A. Herbaceous stem cuttings B. Leaf cuttings C. Leaf bud cuttings D. Root cuttings E. Softwood cuttings F. Semi-hardwood cuttings G. Hardwood cuttings - . Deciduous . Narrow leaf evergreens
Objective #2 Each student will maintain conditions necessary for good and rapid rooting of cuttings and root at least 85% of the cuttings mentioned in objective number one.	A. Mediums B. Water . Mist systems C. Bottom heat D. Wounding E. Hormones
Objective #3 Each student will list on a written or oral quiz for each type of cutting mentioned above the name of at least one plant that can be propagated by each method.	A. Herbaceous stem cutting - coleus B. Leaf cuttings - sanseveria, rex begonia C. Leaf bud cuttings - peperonia D. Root cuttings - philodendron E. Softwood cuttings - Boston Ivy, rose F. Semi-hardwood cuttings - bayberry, euonymous G. Hardwood cuttings . Deciduous - privet, forsythia . Narrow leaf evergreen - taxus

01.0505-02 - Code

ASEXUAL PLANT PROPAGATION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
The teacher will discuss and demonstrate each type of cutting followed by students making the same type of cutting. Only one type of cutting will be considered in one class period.	A. Students will take notes. B. Students will make cuttings	The teacher will inspect each student's cuttings.
The teacher will explain importance of each item and demonstrate how each is used.	Students will root cuttings	The teacher will determine % of cuttings rooted by each student.
The teacher will write the name on the board of plant used in class for each type of cutting and any additional plants propagated by that method.	Students will take notes.	Oral or written quiz

Code - 01.0505-02

Title - ASEXUAL PLANT PROPAGATION

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Division Objective #4 Each student will successfully propagate in class plants by division.	Division
Objective #5 List on a written or oral quiz at least one plant that can be propagated by division.	A. Chrysanthemum B. Snake plant C. Fern
Unit 3 - Separation Objective #6 Each student will successfully propagate plants, in class, by separation.	Separation
Objective #7 Each student will state on a written or oral quiz at least three plants that can be propagated by separation and the plant structures used for propagation.	A. Tulip (bulb) -bulblet B. Gladiola (corm)-cormel C. Dahlia - tuber D. Iris - rhizome

01. 0505-02 - Code

ASEXUAL PLANT PROPAGATION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Teacher demonstration	Students will propagate plants by division.	The teacher will observe the survival of plants divided by each student.
The teacher will write the name of the plants on the board that his students will divide and also any others.	Students will take notes.	Oral or written quiz
Teacher demonstration.	Students will propagate plants by separation.	The teacher will observe the survival of each student's separated plants.
Teacher when demonstrating division will write name of plant on board with plant structure used for propagation.	Students will take notes.	Written or oral quiz

Code - 01.0505-02

Title - ASEXUAL PLANT PROPAGATION

OBJECTIVES BY UNIT	CONTENT
Unit 4 - Layerage Objective #8 Each student will successfully propagate plants by tip-layering, simple layering, serpentine layering, mound layering, and air layering, in class.	A. Tip layering B. Simple layering C. Serpentine layering D. Mound layering E. Air layering
Objective #9 Each student will state on a written or oral quiz for each type of layering mentioned above the name of at least one plant that can be propagated by each.	A. Tip layering - black raspberry B. Simple layering - forsythia C. Serpentine layering- forsythia D. Mound layering - cotoneaster, hydrangea E. Air layering - rubber plant, dumb cane
Unit 5 - Graftage Objective #10 Each student will state on a written or oral quiz why some plants are propagated by grafting.	To improve vigor of a particular variety of plant it is grafted onto a more vigorous rootstock.
Objective #11 Each student will state on a written or oral quiz what three conditions greatly determines the failure or success of each graft.	A. The compatibility of each plant part. B. The closeness of fit C. Cambial contact
Objective #12 Each student will state on a written or oral quiz what is meant by bench grafting.	Bench grafting is a term applied to the operation of grafting a scion on a root which is not in soil.
Objective #13 Each student will propagate plants by grafting with at least 75% success	Different types of grafts . Whip and Tongue graft . Splice graft . Saddle graft . Wedge Graft . Side graft . Veneer graft . Cleft graft . Budding

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Teacher demonstration	Each student will propagate plants by each of five layering techniques.	Teacher will observe success of students work in layering.
Write name on board of each plant propagated.	Students will take notes.	Written or oral quiz.
Explain to students in class.	Students will take notes.	Written or oral quiz
Explain to students in class.	Students will take notes.	Written or oral quiz
Explain to class.	Students will take notes.	Written or oral quiz.
The teacher will demonstrate one or more types of grafts used by local horticultural businesses. Students will practice on twigs.	Students will practice different grafts on twigs. Students will make actual grafts.	Teacher will observe students % of success.

MODULE OF INSTRUCTION

Title - ASEXUAL PLANT PROPAGATION

Code - 01.0505-02

RESOURCE MATERIALS

1. A Manual on Nursery Practices, California State Polytechnic College, Instructional Materials for Teaching Agriculture —Dept. of Agricultural Education, University of California, Davis, California
2. Plant Propagation Practices. Wells, James S.
3. Plant Propagation. Hahlstede: Halier.
4. America's Garden Book, James and Louise Bush Brown.
5. Plant Propagation Practices — Wells, J. S. New York- MacMillan, 1965
6. Home Propagation of Ornamental Trees and Shrubs
   G80 - USDA Home and Garden Bulletin — 10¢
7. New Shrubs from Old by Layering (Schaufler and Pridham) - 5¢-
   Bulletin No. E 1006

MODULE OF INSTRUCTION

Title - PLANT PROPAGATION FROM SEED Code - 01.0505-03

DESCRIPTION:

The student will be able to propagate annuals, perennials and woody plants from seed.

Included are, seed gathering; purchasing seed; seed treatment, extraction and cleaning, scarification, stratification, treatment with fungicide, preparation of a soil or artificial mix, seed germination, and transplanting.

DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Annuals and Perennials	4	11
2. Woody Plants	4	11
	8	22

Revised June, 1974

MODULE OF INSTRUCTION

Title - PLANT PROPAGATION FROM SEED

Code - 01.0505-03

OBJECTIVES to be obtained:

Each student will be able to:

1. Diagram and label on a written quiz a typical seed and all its parts.
2. Calculate, given a seed catalog, on a written quiz, the amount of seed of a given variety necessary to provide a given number of saleable plants.
3. Given a seed catalog students will be able to order via phone or letter a specified amount of seed.
4. Mix a soil or artificial mix in the laboratory that is appropriate for seed germination and growing on of plants.
5. Sterilize, or pasteurize, the germination media chemically or with steam, in the laboratory properly.
6. Drench germination media with a fungicide to prevent damping-off.
7. Sow seed in a flat in the laboratory according to recommended practices.
8. Germinate seed in the laboratory so that an even stand of seedlings is produced.
9. Transplant seedlings at a rate of 200 per hour with 95% survival.
10. Directly sow seed into retail containers and produce saleable plants.
11. State on a written or oral quiz the three groups that woody plant seeds fall into from the standpoint of collection and extraction.
12. State on a written or oral quiz the importance of the following when collecting seed: mother plant, size of seed, origin, color of fruit at time of seed collection, time of year seed is collected.

MODULE OF INSTRUCTION

Title - PLANT PROPAGATION FROM SEED

Code - 01.0505-03

OBJECTIVES to be obtained:

Each student will be able to: (continued)

13. State on a written or oral quiz, four common methods of woody plant seed collection.

14. Calculate the amount of seed of a given woody plant variety necessary to provide a given number of healthy transplants on a written quiz.

15. Apply objectives 11 through 14 by collecting enough woody plant seed to provide a given number of transplants.

16. State on a written or oral quiz, the importance of purchasing only certified seed.

17. Order specified quantities of seeds from catalog via phone or letter to produce a predetermined number of seedlings.

18. Treat seed in the laboratory so that it will germinate.

19. Prepare a seed bed according to recommended practices.

20. Sow woody plant seed in a seed bed according to recommended practices, producing healthy transplants.

21. Sow woody plant seed in a flat filled with an appropriate medium.

22. Culture seedlings producing healthy transplants.

23. Transplant seedlings according to recommended practices with 95% survival.

01.0505-03

Title - PLANT PROPAGATION FROM SEED

OBJECTIVES BY UNIT	CONTENT
1. Annuals and Perennials 1. Each student will diagram and label on a written quiz a typical seed and all of its parts.	A. Seed parts . Testa . Inner seed coat . Endosperin . Cotyledon . Radicle . Micropyle B. Functions of parts
2. Each student will calculate, given a seed catalog on a written quiz, the amount of a given variety necessary to provide a given number of saleable plants.	. Seed catalog
3. Given a seed catalog, student will be able to order via phone a specified amount of seed.	. Necessary information when ordering seed - . Name of plant and variety . Catalog number . Amount of seed

EDUCATION

01.0505-03 - Code

PLANT PROPAGATION FROM SEED - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Diagram a typical seed on the blackboard. B. Give students seeds soaked in water, knives, and hand lense. C. Students will dissect seeds and identify parts as instructor points to diagram and names parts and function of each.	. Students will dissect seeds and identify parts.	. Written quiz.
A. Teacher will demonstrate how this is done on blackboard or overhead. B. Teacher will given students a number of practice problems to work out.	. Students will work out practice problems.	. Written quiz.
A. Teacher will discuss necessary information when ordering seed. B. Have students write letter or fill in order blank for ordering seed. C. Have students simulate a telephone conversation with one student ordering seed and the other taking order.	A. Students ordering seed by letter or order blank. B. Students ordering seed by simulating telephone conversation.	A. Student's letter or order blank. B. Teacher observation of student's performance in simulating telephone conversation.

01.0505-03

Title - PLANT PROPAGATION FROM SEED

OBJECTIVES BY UNIT	CONTENT
4. Each student will mix a soil or artificial mix in the laboratory that is appropriate for seed germination and growing on of plants.	A. Content . Properties of a good germination media. . Materials used in a good germination media. B. Materials . Cement mixer . Fertilizer, limestone, trace elements . Sphagnum peat, vermiculite, perlite, soil . Flat shovels
5. Each student will sterilize, or pasteurize, the germination media chemically or with steam, in the laboratory properly.	A. Steam sterilization (pasteurization) 180°F for 30 minutes. B. Chemical sterilization - ex. vapam
6. Students will drench the germination media with a fungicide to prevent damping-off.	A. Damping-off B. Soil drenches C. Materials . Germination media . Soil drench i.e. pawo drench . Cup measure . Watering can
7. Each student will sow seed in a flat in the laboratory according to recommended practices.	A. How to sow seed B. Materials . Flat . Germination mix . Seed . Vibro-seeder

01.0505-03 - Code

PLANT PROPAGATION FROM SEED - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A . Lecture B . Teacher will demonstrate how to properly mix germination media.	A. Students will take notes. B. Each student will mix germination media before this module is finished.	. Teacher observation of students performance.
A . Lecture B . Teacher will demonstrate each method.	. Each student will sterilize (or pasteurize) germination media before this module is finished.	. Teacher observation of student's performance.
A . Lecture B . Teacher will demonstrate how to use a soil drench.	. Each student will drench a germination media before this module is finished.	.Teacher observation of student's performance.
. Teacher will demonstrate how to sow seed.	. Each student will sow seed.	. Teacher observation of student's performance.

Title - PLANT PROPAGATION FROM SEED

OBJECTIVES BY UNIT	CONTENT
8. Each student will germinate seed in the laboratory so that an even stand of seedlings is produced.	. Conditions essential for germinating seed - . moisture . temperature . oxygen . light in some cases
9. Each student will transplant seedlings at a rate of 200 per hour with 95% survival.	. Materials - . containers . seedlings . media . water
10. Each student will directly sow seed into retail containers and produce saleable plants.	A. Seed, i.e.: tomato, pepper, musk melon, summer squash B. Saleable containers, i.e.: jiffy 7, 3 inch peat pots C. Soil or artificial mix.
11. Each student will state on a written or oral quiz the three groups that woody plants fall into from the stand point of collection and extraction.	A . True seeds - readily extracted from dry fruits or cones, include: conifers, species having pods (honeylocust, locust) or capsules (poplar, willow). B . Dry fruits - generally seed is not extracted but entire fruit is planted, include: (1) free of appendages (acheues, such as eriogenium), or retaining styles (clematis); (2) nuts (oak, chestnut); or (3) key fruits (ash, elm, maple). C . Fleshy fruits - seed can be extracted by marinating the fruit in water floating off the fleshy pericarp, including: barberry, raspberry, apple.

EDUCATION

01.0505-03 - Code

PLANT PROPAGATION FROM SEED - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture B. Teacher will demonstrate how to provide essential conditions.	. Students will germinate seed.	A. Teacher observation of student's performance B. Teacher will check stand of seedlings.
A. The teacher will show students containers. B. The teacher will demonstrate how to transplant seedling.	. Students will transplant seedlings.	A. Teacher observation of student's performance. B. Teacher will check survival of transplanted seedlings.
. Teacher will demonstrate how to directly sow seed into saleable container.	A. Students will directly sow seed into saleable container. B. Students will germinate seed producing saleable plants.	. Teacher observation of student's performance.
. Lecture	. Students take notes.	. Written or oral quiz.

01.0505-03

Title - PLANT PROPAGATION FROM SEED

OBJECTIVES BY UNIT	CONTENT
12. Each student will state on a written or oral quiz the importance of the following when collecting seed: mother plant, size of seed, origin, color of fruit at time of seed collection, time of year seed is collected.	A . Mother plant - collect seed from plants bearing seeds of average or larger size. B . Size of seed - larger the seed the greater the vigor and development of seedlings. C . Origin of Seed - seed from southern areas produces plants more susceptible to cold temperatures. D . Color of fruit at time of seed collection - different colors of seeds of different varieties of plants denotes ripeness of seed. E . Time of year seed is collected - ripeness of different varieties of plants is in different seasons.
13. Each student will state on a written or oral quiz four common methods of woody plant seed collection.	A . From standing trees by hand B . From standing tall trees that must be climbed and seed picked by hand. C . By cutting seed off tree with hooks or clippers. D . From rodent caches.
14. Each student will calculate the amount of seed of a given woody plant variety necessary to provide a given number of healthy transplants.	A . Number of seeds per pound. B . % Purity C . % Soundness
15. Each student will apply objectives 11 through 14 by collecting enough woody plant seed to provide a given number of transplants.	. Refer back to objectives 11 through 14.

01.0505-03 - Code

EDUCATION

PLANT PROPAGATION FROM SEED - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
. Discuss with students in lecture.	. Students will take notes.	. Written or oral quiz.
. Lecture.	. Students will take notes.	. Written or oral quiz.
A. Lecture type class. B. Teacher will demonstrate C. Students will calculate using sample problems.	A . Students will take notes. B . Students will mark sample problems.	. Written quiz.
. Field trip to collect seeds.	A . Students will determine amount of seed necessary. B . Students will collect seed.	. Teacher observation of student's performance.

Title -

PLANT PROPAGATION FROM SEED

OBJECTIVES BY UNIT	CONTENT
16. Each student will state on a written or oral quiz the importance of purchasing only certified seed.	. Certified seed.
17. Each student will order specified quantities of seed from a catalog via phone or letter to produce a predetermined number of seedlings.	. Necessary information when ordering seed. . Name of plant and variety . Catalog number . Amount of Seed
18. Each student will treat seed in the laboratory so that it will germinate.	A. Extraction and cleaning B. Scarification (external dormancy) C. Stratification (internal dormancy) D. Treatment with fungicide.
19. Each student will prepare a seed bed according to recommended practices.	. Seed bed preparation
20. Each student will sow woody plant seed in a seed bed according to recommended practices producing healthy transplants.	. Sowing seed in seed bed.

EDUCATION

01.0505-03 - Code

PLANT PROPAGATION FROM SEED - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
. Lecture	. Students will take notes.	. Written or oral quiz.
A . Teacher will discuss necessary information when ordering seed. B . Have students write letter or fill in order blank for ordering seed. C . Have students simulate a telephone conversation with one student ordering seed and the other taking the order.	A. Students ordering seed by letter or order blank. B. Students ordering seed by simulating telephone conversation.	A. Teacher evaluation of student's letter or order blank. B. Teacher observation of student's telephone conversation simulation.
A . Lecture B . Teacher demonstration.	A. Students will take notes. B. Students will extract, clean, scarify, stratify and treat seed with a fungicide.	. Teacher observation of student performance.
. Teacher demonstration.	. Students will prepare seed bed.	. Teacher observation of student performance.
. Teacher demonstration.	. Students will sow seed in a seed bed.	. Teacher observation of student performance.

Title -

PLANT PROPAGATION FROM SEED

OBJECTIVES BY UNIT	CONTENT
21. Each student will correctly sow woody plant seed in a flat, filled with an appropriate medium, and provide conditions causing germination.	A. Review objective 18. B. Sowing woody plant seed in a flat. C. Germination of woody plant seed.
22. Each student will culture seedlings producing healthy transplants.	. Culture of woody plant seedlings . light intensity . fertility . moisture . temperature . thinning . length of time before transplanting . insect and disease control
23. Each student will transplant seedlings according to recommended practices with 95% survival.	. Transplanting seedlings.

01.0505-03 - Code

PLANT PROPAGATION FROM SEED - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
. Teacher demonstration.	. Students will sow seed in a flat filled with an appropriate medium.	. Teacher observation of student performance.
A . Lecture B . Teacher demonstration of how to provide correct conditions.	. Students will culture seedlings.	. Teacher observation of student performance.
. Teacher demonstration.	. Students will transplant seedlings.	A. Teacher observation of student performance. B. Teacher will check survival of transplanted seedlings.

MODULE OF INSTRUCTION

Title - PLANT PROPAGATION FROM SEED Code - 01.0505-03

RESOURCE MATERIALS

1. Ball Red Book. George J. Ball, Inc., West Chicago, Ill. 60185.
2. Bedding Plants. Penn State, John W. Mastalerz, 101 Tyson Buildings, The Penn State University, University Park, Pennsylvania, 16802. $2.00 per copy.
3. Plant Propagation. Mahlstede - Haber.
4. Plant Propagation Practices. Wells.
5. Woody Plant Seed Manual. USDA Miscellaneous Publication No. 654.
6. Grower Talks. George J. Ball, Inc., West Chicago, Ill. 60185
7. Growers Circle News. Yoder Brothers, Inc., Barborton, Ohio 44203.
8. Flowers From Seed. Ernie Schaufler, .20¢ per copy. Catalog No. 1B-20.

MODULE OF INSTRUCTION

Title - GROWING AND CARING FOR TURF GRASS

Code - 01.0506-01

DESCRIPTION:

This module considers the basic preparatory and maintenance operations in turf grass culture and the preparation of soils for lawn seedbeds, the identification of grass seed and plants, the mixing of lawn seeds, and proper seeding methods.

In addition, irrigation and fertilization of grasses, weeds, and disease control in turf and proper mowing are included.

Previous experience in general fertilization practices, soil tillage and knowledge of plant structure will prove beneficial to the student enrolling in the turf grass module. Field and laboratory activities should include the development of lawns, and the maintenance of turf areas. Areas such as land lab, school grounds and turf plots within the area should be considered for field and lab activities.

MAJOR DIVISIONS OR UNITS of CONTENT	Time Allocation	
	Class	Other
1. Preparation of Lawn Seedbed	1	7
2. Selecting Appropriate Turf Grasses	2	2
3. Seeding Lawn Areas	1	4
4. Management and Renovation of Turf	2	6
5. Weeds, Disease, and Insect Control in Turf	1	4
	7	23

Revised June, 1974

MODULE OF INSTRUCTION

Title - GROWING AND CARING FOR TURF GRASS

Code - 01.0506-01

OBJECTIVES to be obtained:

The student will be able to:

1. Prepare a Lawn Seedbed
   - Testing soil for pH and tilth levels
   - Applying fertilizer, lime, topsoil, peatmoss in correct amount to prepare a seedbed
   - Raking and rototilling soil to mix soil constituents prior to seeding
   - Grading uneven areas of seedbed

2. Select Appropriate Turf Grasses
   - Identifying common turf grass seeds and knowing best uses of each variety
   - Mixing various grass seed varieties to obtain selected percentage of varieties
   - Identifying turf grass plants

3. Seed Lawn Areas
   - Calibrating seed broadcasters for number of seed required per square foot
   - Operating seed broadcasters to obtain even seeding throughout seedbed
   - Mulching seeded areas where washout potential exists
   - Rolling seeded areas to prevent drying

4. Manage and Renovate Turf
   - Testing turf areas for moisture level before drought injury develops
   - Operating portable and permanent irrigation systems
   - Fertilizing and liming turf areas to provide even growth of turf
   - Planting ground covers in areas too shady for turf grass production

5. Control Weeds, Disease and Insect in Established Turf
   - Identifying common turf weeds grouped according to chemical control
   - Testing turf for disease and insect infestation
   - Applying chemical controls safely with hand and powered sprayers and granular material to obtain effective control of weed, disease, and insect pests.

01.0506-01

Title - GROWING AND CARING FOR TURF GRASS

OBJECTIVES BY UNIT	CONTENT
Unit 1 1. Preparation of Lawn Seedbed .Testing soil for ph and tilth levels .Applying fertilizer, lime, peat moss in correct amounts .Raking and rototilling soil to mix soil constituents .Grading uneven areas of seedbed	A. Grading and draining the site B. Soil conditions necessary for good turf . Organic matter . pH . Nutrient levels C. Preparation of soil for seedbed . Addition of topsoil . Liming and fertilizing . Mixing soil constituents . Final grading and surface preparation
Unit 2 2. Selecting Appropriate Turf Grasses .Identifying common turf grasses .Mixing various grass seed varieties .Identifying turf grass plants	A. Importance of proper selection B. Types and varieties of grasses . Seed size . Uses and growth characteristics of common varieties C. Using seed mixture
Unit 3 3. Seeding Lawn Areas .Calibrating seed broadcasters .Operating seed broadcasters .Mulching seeded areas .Rolling seeded areas to prevent drying	A. Seasons for seeding B. Seeding rates . Seed size . Budgetary allowances C. Adjustment and operation of sowing equipment D. Hand applied seedings E. Mulching in high erosion areas

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A.Demonstrate grading and leveling technique by a model. Have set in a small container filled with soil. B.Distribute soil samples containing varying amounts of organic matter. C.Field trips to observe the preparation of a lawn seedbed at a commercial building site.	Preparation of a seedbed in the school land laboratory or other available land. Involve the student in following activities: . Testing soil for pH . Adding peat moss, fertilizer and other soil constituents . Tilling soil . Raking soil and leveling . Rolling seedbed	The instructor should maintain a checklist to determine student proficiency in: .Testing soil for pH .Grading with landscapers rake .Rototilling soil constituents .Rolling seedbed areas .Fertilizing seedbed
A.Field trips to turf areas showing the variation in varieties and conditions under which they grow. B.Seed samples to be reviewed by students. C.Overhead projector to demonstrate relative seed sizes.	Selecting seed for site prepared in Unit 1. Student activities: . Determine moisture, nutrient and light levels of site to be seeded . Select grass varieties that will produce a suitable stand of turf . Prepare seed mixture based on percentage of varieties recommended	. Identification of turf grass seeds . Mixing seeds of various turf grasses . Prepare seed mixture for various cultural conditions
A.Overhead projector--demonstrate dates for best planting lawn seeds. B.Chalk board presentation to illustrate ways for planning the amount of materials needed for a lawn area	Seeding of prepared site. Student activities: · Measuring total site area to determine appropriate number of pounds of seed to be applied · Adjusting seed applicators to provide correct amount of seed · Applying seed to prepared seedbed · Protection of seeding by use of mulch	.Applying seed by flail distributor .Applying seed by hand .Calibrating seeders for given conditions .Applying mulch to seeded areas

Title - GROWING AND CARING FOR TURF GRASS

OBJECTIVES BY UNIT	CONTENT
Unit 4 4. Management and Renovation of Turf	A. Determining when to irrigate turf B. Operation and maintenance of portable and permanent irrigation systems C. Applying lime . Types and amounts . Methods of applying . Determining when to apply . Application equipment D. Applying fertilizer . Determining the frequency of application . Types and amounts to use . Adjust spreaders for application of fertilizer at required nutrient levels E. Shade area problems . Use of plant and artifical ground covers
Unit 5 5. Weeds, Disease, and Insect Control in Established Turf	A. Common turf weeds . Major turf categories of weeds according to chemical control methods B. Controlling turf weeds . Mechanical control . Chemical control C. Insect and disease control in turf . Recognizing symptoms . Selecting control methods . Preparing and applying chemical controls

01.0506-01 - Code

GROWING AND CARING FOR TURF GRASS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Slides on symptoms of water deficiency in turf acreas B. Slides showing operation of portable and permanent irrigation systems C. Chalk board presentation on determining the amount of fertilizer to apply to particular lawn areas D. Make available samples of various types of fertilizer to class E. Observation of shaded areas	A. Field trip to existing turf or turf that is established on school grounds. B. Student activities: . Setting up and operating portable and permanently installed irrigation systems . Preparing feeding schedule for turf grass areas. Fertilizing areas with various types of application equipment—liquid and granular feed systems . Reseeding areas of turf that have been killed by disease, drought, etc. . Substituting ground covers for turf in shaded areas . planting ground covers in varying soil conditions . artificial ground covers	The instructor should maintain a check list to determine student proficiency in: . Testing turf areas for drought injury . Setting up portable irrigation systems . Applying lime and fertilizer through spreader . Adjust spreaders to apply adequate amounts of material . Planting ground cover in shaded areas of lawn
A. Review specimens of commom turf weeds B. Slide series showing the application of chemical weed and insect controls C. Specimens of common turf insects	A. Select weeded areas of land lab or other available land and provide students opportunity to select, prepare and spray weed and insect chemical controls. B. Student should obtain experience in application of chemical controls through hand sprayers, power sprayers, and special application mixes.	. Identify common turf weeds according to chemical control that can be used . Spraying weed infestation with chemical controls . Mixing chemical weed control solution . Identifyiny common turf insects and diseases

MODULE OF INSTRUCTION

Title - GROWING AND CARING FOR TURF GRASS Code - 01.0506-01

RESOURCE MATERIALS

Books

1. Turf Management, by H. Burton Musser
2. Hoosier Vocational Horticulture Course in Turf. Indiana State Department of Public Instruction, Indianapolis
3. Ornamental Horticulture. A Guide for Planning and Organizing Occupational Programs. University of the State of New York, State Education Department, Albany, N. Y. Pages 35-39.

Periodicals

1. Ruters Weed Science Notes
John A. Meade, Editor
Extension Service, College of Agriculture
New Brunswick, New Jersey 08903

2. Today's Nursery Thoughts
L. D. Little, Editor
Extensive Service, College of Agriculture
New Brunswick, New Jersey 08903

3. Scotts Guide to Common Turf Grass Varieties

Bulletins

U.S.D.A. (Division of Publications,Office of Information,Wash.D.C. 20250)

G-169	How to Buy Lawn Seed
G-89	Selecting Fertilizer for Lawns and Gardens
G-51	Better Lawns--Establishment, Maintenance, Renovation, Lawn Problems, Grasses

Cornell Publications (Mailing Rm. Bldg. 7, Research Park, Cornell University, Ithaca, New York 14850)

922 Home Lawns--John Cornman

Picture Clues to Lawn Troubles--Smith and Cornman

Algae in Turf
Chickweed
Dichondra for Lawns
Golf Course
Repairing Snowmold
Veronica
Ground Ivy
Mondo Grass
To Build a New Lawn
Putting Greens
Repair of Draught Damaged Lawns

Other Bulletins

Available through: Mail Service, Hewitt Hall, University of New Hampshire, Durham, New Hampshire 03824

1. Care of the Established Lawn EF55
2. Chemical Weed Control in Lawns IGI

Title - GROWING AND CARING FOR TURF GRASS Code - 01.0506-01

RESOURCE MATERIALS (continued)

Audio-Visual
1. Films* Greener on Your Side -- 23 minute color
2. Slides* Lawn Care and Lawn Problems -- 51 slides

*Available from: Department of Communication Arts, Robert Hall, Cornell University, Ithaca, New York 14850

MODULE OF INSTRUCTION

Title - LAWN CONSTRUCTION Code - 01.0506-02

DESCRIPTION:

This module will include all the basic steps necessary to construct a good turf foundation. The steps involve the application of materials, incorporation of material by rototilling, grading, seeding, watering, laying sod and rolling. The student will be actively involved in each of these processes.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Application of Material	2	3
2. Rototilling	2	3
3. Grading	2	6
4. Seeding and Rolling	3	3
5. Laying Sod	1	2
6. Maintaining Sod	1	2
	11	19

Revised June, 1974

MODULE OF INSTRUCTION

Title - LAWN CONSTRUCTION

Code - 01.0506-02

OBJECTIVES to be obtained: The student will be able to:

1. Spread moss (organic matter)
2. Spread lime, agricultural gypsum or ferrous sulfate according to the results of the Ph test
3. Spread fertilizer with a spreader according to the results of soil testing and Ph
4. Apply pesticide with a spreader or sprayer
5. Adjust the gauges of the rototiller according to specifications of the instructor
6. Operate a gasoline driven rototiller
7. Operate a P.T.O. drive rototiller
8. Rough grade with an iron rake
9. Fine grade with a wood or aluminum rope
10. Retain the debris
11. Apply the seed with a spreader (hopper type)
12. Apply seed by the hand broadcast method
13. Roll the seeded lawn
14. Start the watering process
15. Set sod in place
16. Tamp sod
17. Water sod
18. Apply fertilizer and pesticide to sod and water
19. Mow sod

Code - 01.0506-02

Title - LAWN CONSTRUCTION

OBJECTIVES BY UNIT	CONTENT
1. Application of Material Objective 1 The students will spread the material to be incorporated into the new lawn.	Spreading equipment . Hopper spreader . Cyclone spreader . Pail . Iron rake
Objective 2 The student will take a Ph test to determine the correct amount of lime or ferrous sulfate to be used to adjust the Ph of the soil.	Soil testing equipment . Cornell soil testing list or equivalent . Soil auger . Soil collecting bags (6 oz. plastic)
Objective 3 The student will figure the proper analysis and amount of fertilizer to use according to the type of grass seed being planted. The student's calculations will be based on Cornell Recommends for field crops.	Soil testing equipment . Cornell soil testing list or equivalent . Soil auger . Soil collecting bags (6 oz. plastic) . Cornell recommends for turf crops

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
The teacher will demonstrate the methods of spreading peat moss, lime, fertilizer and pesticides.	Each student will use the spreaders and rakes on his assigned area. The student will load and adjust the spreading equipment according to manufacturers, specifications	All material must be evenly distributed according to manufacturers, specifications or according to the results of soil testing.
The teacher will demonstrate the correct method of using a soil test list, a soil auger and method of collecting soil samples.	A. The student will take soil samples using a soil auger. At least four samples will be taken from teacher designated areas. B. The student will test these samples according to the directions supplied by the manufacturer and directions given in class by the teacher.	The student will demonstrate the proper method of taking soil samples and suppy the instructor with the correct results of the soil test.
The teacher will demonstrate the correct method for figuring fertilizer analysis and the correct method to use the fertilizer charts in Cornell Recommends.	The student, given a Cornell Recommends for turf grass, will figure out the proper fertilizer analysis for the particular soil test results and for the type of grass seed he is planting.	The student will in writing correctly figure the correct fertilizer analysis according to his soil test results. (Cornell Recommends for turf crops may be used)

Code - 01.0506-02

AGRICULTURAL

Title - LAWN CONSTRUCTION

OBJECTIVES BY UNIT	CONTENT
Objective 4 The student will rake, mechanically spread and hand broadcast material.	Material to be spread . Peat moss, (6 cu. ft. bales) . Fertilizer . Lime or gypsum . Pesticides
2. Rototilling Objective 5 The student will adjust the depth gauges of the rototiller.	Rototilling equipment . Gas driven rototiller . PTO driven rototiller
Objective 6 The student will operate the gas driven rototiller	A. Rototiller operation demonstration. B. Student practice on school plot.
Objective 7 The student will operate the power takeoff driven rototiller.	
3. Grading Objective 8 The student will rough grade with an iron rake	A. Raking or grading tools . Iron rake (14 tooth) . Wood rake . Aluminum rake . Square shovel . Wheelbarrow B. Roughing grade with rakes
Objective 9 The student will fine grade with a wood or aluminum rake.	C. Finishing grade with rakes D. Debris in lawn construction is cleaned up and disposed of. All materials that may be shredded will be removed to the shredding area.
Objective 10 The student will remove the debris	

01.0506-02 - Code

LAWN CONSTRUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
The peat moss and pesticides will be spread according to manufacturers, specs. The lime will be spread according to soil test and Cornell Recommends. Teacher demonstrates application of peat moss at general rate of 30 cubic feet per 1000 sq. ft.	Each student will visually check the area spread by the machine spreader and hand broadcast any area not adequately covered by the spreader.	All material must be evenly distributed.
The teacher will demonstrate the method of holding and guiding the rototiller over the ground. Safety must be kept in mind at all times (gas rototiller). Note gear and speed is determined by soil condition. PTO driver tiller, on back of tractor. . Pattern and speed area . Demonstrated by the instructor. . Gear positions for tractor are . Demonstrated by teacher.	A. Each student will operate the gasoline engine tiller and the PTO tiller to completely prepare his designated seed bed area. B. The students must have work shoes above the ankles because rocks may be thrown up.	All patterns must be straight and at uniform depth. Depth will be predesignated by the teacher. Three measurements will be taken by the teacher and averaged to determine accuracy and uniformity.
The teacher will demonstrate the correct way to hold the rake to produce a grade that will require minimal soil removal.	Each student will fine grade with an aluminum or wood rake the predesignated area, holding the rake at the angle demonstrated by the instructor.	The soil must be leveled to a degree of accuracy so that water will not puddle when applied to the area.
	Students are assigned areas ranging from 50 to 100 sq. ft. in seed bed area to provide seed bed grading experience (students are to remove all particles larger than 1")	The student will hold ropes at correct angles, grade is to be level and no particles larger than 1" are to be left on the surface.

Code - 01.0506-02

Title - LAWN CONSTRUCTION

OBJECTIVES BY UNIT	CONTENT
4. Seeding and Rolling Objective 11 The student will apply the seed with a hopper type spreader	Seeding and rolling tools . Hopper type spreader . 14" roller . Pail . Fan rake
Objective 12 The student will apply seed by the hand broadcast method.	Determining number of pounds of . Seed for lawn . Seedmixture .to be determined by the size of the designated area
Objective 13 The student will roll the seeded lawn	
Objective 14 The student will correctly water the newly seeded lawn	Irrigation of seeded areas . Sprinkler and hose
5. Laying Sod	
Objective 15 The student will set sod in place.	Press sod in place
Objective 16 The student will tamp sod	Tamp
Objective 17 The student will water sod	Water sod Irrigation equipment
Objectives 18 & 19 The student will maintain sod.	A. Spreader B. Sprayer C. Irrigation equipment D. Mower

EDUCATION

01.0506-02 - Code

LAWN CONSTRUCTION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. The teacher will load and adjust the spreader with seed. The teacher will apply the seed in 4" overlapping strips. B. The teacher will then drag a fan or leaf rake teeth down, over the seeded area, to insure good soil contact with grass seed. C. The teacher will demonstrate the proper use of a hand roller.	A. The student will apply seed at the rate designated by the manufacturers, specifications. B. The area will then be raked with a leaf rake or fan rake to insure good soil contact with the seed. C. The student will roll the assigned seed bed area. Seeding raked in and packed by roller.	A. The student will evenly distribute the seed according to manufacturers specs. Raking will be done according to the instructions given by the instructor. B. All seed must be uniform and rolled. Water must not puddle nor cause erosion of seed or soil from the seed bed. (Objectives 12,13,14)
A. The teacher will demonstrate the proper method of watering so as to provide adequate moisture and prevent erosion of seed or soil.	A. When completed area must be watered according to demonstration provided by the teacher.	
A. All previous steps are the same as a seed lawn. After final grade is established teacher will lay sod. The sod will be tamped in place and watered.	A. Each student will lay 25-50 sq. ft. of sod, tamp and water. B. Each student will maintain the designated sodded area for a period of from 4-8 weeks. C. Maintenance will be performed according to Cornell Recommends for turf grass and the demonstrations given in class by the instructor.	A. All sod will be tight, flat and completely watered. Periodic inspections will be made by the teacher to check for proper maintenance. Such things as disease, over or under fertilization, color and texture will be used for evaluation purposes. This evaluation applies to Objectives 15-19.
A. The instructor will demonstrate the use of spreaders, sprayers, irrigation, and mowing equipment as applicable to the maintenance of sod.		

MODULE OF INSTRUCTION

Title - LAWN CONSTRUCTION Code - 01.0506-02

RESOURCE MATERIALS

Books:
Turf Management, by Burton H. Musser, Revised 1962, McGraw-Hill Publishing
The Lawn Book, by R. W. Schery

Bulletins:
Available from: U.S.D.A. (Division of Publications, Office of Information,
Washington, D. C. 20250)

G-169 How to Buy Lawn Seed
G-89 Selecting Fertilizer for Lawns and Gardens
G-51 Better Lawns - Establishment, Maintenance, Renovation, Lawn Problems, Grasses

Bulletins from Mailing Room, Building 7, Research Park, Cornell University, Ithaca, New York 14850

E - 922 Home Lawns; sale only $.15

Booklets:
From IMS - H 35 Turfgrass Maintenance and Establishment, Teacher's Manual. 150 pages; $3.00

H 36 Turfgrass Maintenance and Establishment Student's Workbook. 150 pages; $3.00

H 37 Athletic Fields (Semi-technical) 19 pages; $.20

H 41 Picture Clues to Lawn Troubles 8 X 10 color pictures; $1.00

Filmstrips and Slide Sets available from IMS:

H 1.3 Types of Turf; 17 color slides, $3.10
H 1.4 Lawn Care and Management; 46 color slides, $7.75
H 1.5 Exploring Turf Grass Occupations; 28 color slides, $5.20
H 1.6 Lawn Weed Identification; 39 color slides, $7.10
H 2.1 Using Power Lawn Mowers Safely; 75 frames in color, $4.00

MODULE OF INSTRUCTION

Title - GREENSKEEPING

Code - 01.0506-03

DESCRIPTION:

Students enrolled in this module develop skills in basic golf greens construction and maintenance of turf grass and greens areas.

The module places emphasis on the maintenance of greens through proper mowing, irrigation and fetilization. The controlling of insects, diseases and weeds for this special turf area is included.

DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Time Allocations Other
1. Construction of Golf Greens	2	1
2. Maintenance of Golf Greens	6	21
	8	22

Revised June, 1974

MODULE OF INSTRUCTION

Title - GREENSKEEPING Code - 01.0506-03

OBJECTIVES to be obtained:

The student will be able to:

1. Describe the construction of a golf green by drawing and labeling the areas of a golf course, "hole".

2. The student will be able to locate and construct water and drainage outlets for a golf course green or tee to insure proper drainage.

3. Estimate water loss on greens, determine time when supplemental irrigation is needed and select appropriate irrigation method.

4. Water a green with sprinklers and by hand to the satisfaction of the instructor, and list two key points that influence the selection of equipment to water a green.

5. Select and set up a mower for a certain segment of a golf course range (within 30 minutes), to the satisfaction of the instructor in terms, of height of cut, and mower operation.

6. State when an aerator, vertical mower and top - dressing should be used on the course.

7. Correctly take a soil sample of a green.

8. Describe or demonstrate the procedure for applying proper amounts of lime or fertilizer to the satisfaction of the instructor.

9. Identify any of the turf diseases, weeds or insects covered in class; and using "Cornell Recommends for Turfgrass:, correctly identify a spray control program for same.

10. Place a cup to the satisfaction of the instructor.

Code - 01.0506-03

Title - GREENSKEEPING

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT
Unit 1. Construction of Golf Course Objective #1. Describe the construction of a golf green by drawing and labeling the areas of a golf course, "hole".	A. Diagramming the areas of a golf course "hole:. (Ref. #2 Pg. 105 . Names of the areas of a golf course "hole" . tee . green . fairway . cup . trops . bunker . rough . hazard . flag
Objective #2 The student will be able to locate and construct water and drainage outlets for a golf course green or tee to insure proper drainage.	A. Factors to consider when designing and installing a drainage system for a golf course "hole". . Preparation of soil . type used . sand . soil . peat mix . mixing ratio . 2-1-1 . 1-1-1 . methods of sterilization . chemical . other . Proper drainage for a golf course tee and green. . surface preparation . contour . grading of green . 22-24 blow final elevation . ditching . subsurface preparation . subsoil is graded in swales . 1-20 feet apart . clay tile . laid in swales . 0.5 % to 3% fall or slope . cover tile with . tar paper . fiber glass

01.0506-03 - Code

EDUCATION

GREENSKEEPING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture using visuals of golf course "hole" with the overhead projector, (Ref. #2 Pg. 105 & 120) B. Field trip to a local golf course. C. Guest speaker D. Handout diagrams for a golf course "hole: and discuss with class.	The student will be able to diagram and label the areas of a golf course "hole".	The student will diagram and label the areas of a golf course "hole" to the satisfaction of the instructor.
A. Discuss with class by using a handout of a cross section for a golf green showing the drainage and construction materials. B. Field trip to a local golf course. C. Have a guest speaker in and discuss the construction of a golf course. D. Make transparencies with overlays and use the over head projector when lecturing to class. E. Ditto's of water pipe sizes and volume rates can be handed out to students. (Ref. #1. Pg. 335 & 338 Other ref. # 152). F. Demonstrate the proper seeding techniques to class in lab.	A. The student can diagram a greens cross-section and list all parts. B. The student will list and locate all parts for a simulated or local golf course green. C. The student will prepare and sow a golf course green properly.	A. Written test - Students will be handed a numbered cross-section of a green to fill in parts missing. B. Student will be given a performance test on a simulated course or a local course to demonstrate his ability to: . Locate outlets . water . drainage . Tell the difference between a water & drainage outlet. . on diagram . on course . Find outlets for a given amount of time. . Seed a green properly.

OBJECTIVES BY UNIT	CONTENT
Unit 1 Objective #2. (continued)	. Cover clay tile with 6" to 8" of · 2B or 1B limestone . Cover limestone with · 1-2" straw eager . Cover the straw layer with · 14-16" (sand, soil, peat mix) B. Preparing a cover for greens and tees. · Seeding of Bent Grasses (Ref. #1 Chap. 6) . method · broadcast · pre-germination . stolons . plugs , sodding

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES

Code - 01.0506-03

Title - GREENSKEEPING

AGRICULTURAL

OBJECTIVES BY UNIT	CONTENT

Unit 2 - Maintenance of Golf Greens
Objective #3.
Estimate water loss on greens, determine time when supplemental irrigation is needed and select appropriate irrigation method.
	A. Factors to consider when irrigating a golf course.
	• Uniform rate of water
	• Absorption of water without run-off
	• Type of sprinkler system chosen
	  • convenience
	  • expense
	B. Reasons for water loss on greens and tees
	• Bent grasses
	  • growth habit
	  • weather
	  • air and wind
	  • soil drainage
	C. Materials needed for irrigating a golf course efficiently
	• Piping
	  • metal
	    • size
	    • installation
	  • plastic
	    • size
	    • installation
	• Sprinklers
	  • underground systems
	    • permanent heads or snap valves
	  • portable sprinklers
	    • perforated hoses
	    • rotary
	    • oscillating
	    • traveling rotary

- Objective #4.
The student will water a green with sprinklers and by hand to the satisfaction of the instructor, and list two key points that influence the selection of equipment to water a green.
(alternate objective in case of rain)
	A. Factors to consider when watering a golf course green properly
	• Sprinklers
	  • size
	  • measuring and distribution
	  • time of watering
	    • day
	    • night
	• Hand watering

01.0506-03 - Code

GREENSKEEPING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture to class B. Field trip to a local golf course to observe the different watering equipment used. C. Demonstrate the different types of watering equipment used in lab. D. Lecture to class, by using overhead projector.	A. Student will be able to explain why golf course greens lose water. B. Students will select the materials and equipment needed for irrigating a golf course green.	A. Written Test - . Student will explain three reasons for water loss on greens. . Student will select and list the materials needed for irrigating a green properly. B. Student will be given an area where he will make a plan and list the materials needed for a golf course green in order to irrigate it properly. C. Student will demonstrate his ability while constructing a green.
A. Demonstrate the different types of watering equipment used on courses. B. Lecture and use the overhead projector. C. Guest speaker (greenskeeper for a local golf course). D. Field trip to a local golf course.	Student can use a small container to determine amount and distribution of water for a particular type of sprinkler. (Ref. #2 Pg. 53)	A. Student will select the proper watering equipment & demonstrate his ability to water a green to the satisfaction of the instructor. B. Performance or written checklist - . Use correct equipment for job? . Use correct amount of water? . Even distribution of water?

Code - 01.0506-03

Title - GREENSKEEPING

OBJECTIVES BY UNIT	CONTENT
Unit 2 Objective #5. The student will select and set up a mower for a certain segment of a golf course range (within 30 minutes), to the satisfaction of the instructor in terms, of height of cut, and mower operation.	A What mowers should you select for a golf course . Types of Mowers . greensmower . accessory equipment (when used) . Reel . single . gang B. What parts of a golf course should you mow and their correct heights . Tee (1" - 1½") . Fairways (1"-1½") . Roughs (2½" -3") . Greens (3/16" - 3/8") . Collars (½") . Aprons (1") C. For proper heights of cut adjust mowers to desired level. D. Mowing the different parts of a golf course range (Ref. #2 Pg. 106) . Greens . grain prevention . Other course areas . roughs . fairways . tees . Whipping - poling . How often should you mow- . roughs . fairways . tees . greens

01.0506-03 - Code

GREENSKEEPING - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Discuss or lecture to class about the various mowing equipment available for a golf course with the use of visuals and mower manuals. B. Demonstrate the various pieces of equipment for mowing golf courses to class in lab. C. Field trip to a local golf course and observe the various mowing equipment in use. D. Guest speaker from a local golf course.	A. Student practice with greensmower to gain proficiency. B. Student practicd adjusting heights on several mowers C. Student on field trip will observe how equipment is handled to mow a green quickly. D. Student will make field trip check for comparing maintenance practices List: greens . Well mowed . Turf color . diseased . weeds . worn	Perfomance Test Checklist A. Selected correct accessory for the condition of the green. B. Adjust mower correctly? C. Operate mower properly? . Check oil . Check gas . mix correctly (2 cycle) D. Mow quickly (time) E. Right direction to prevent "grain". F. Was pattern even?

Code - 01.0506-03

AGRICULTURAL

Title - GREENSKEEPING

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Objective #6.' State when an aerator, vertical mower and top -dressing should be used on the course.	A. Controlling soil compaction on a golf course by aerating the soil - • Where is soil compaction likely to occur- • heavy traffic . approaches to tees & greens . heavy soils • What happens when soil becomes compact • compresses soil particles • reduces size of air spaces in the soil • causes poor root growth • poor top growth • Controlling compact soils • aeration (Ref. #1 Pg. 162, 168,178 Ref. #7) • type • plugs • spiking • when • spring • fall • other • Procedure to follow after soil has been aerated - • greens • remove plugs • lawn rakes • lawn sweepers • tees and fairways • remove plugs • metal mat • vertical mowing • greens • lift grass blades • tees and fairways • depth of thatch • kind of turf • top-dressing • spring • fall

EDUCATION

- Code

- Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and demonstrate equipment in lab. B. Field trip to a local golf course and observe the equipment in use. C. Guest speaker to discuss the different equipment used for aerating compact soils for golf courses. D. Discuss and use the overhead projector with class.	Students will be able to recognize and control compact soils on a golf course by operating the different aerating equipment available for that particular area of the golf course.	A. Student will select the proper equipment for aerating a particular segment of a golf course range. B. Student will be able to select and operate the equipment for aerating any portion of the golf course range. C. Student will give an oral explanation for aerating compact soils and select the proper equipment to use. D. Student will take a written exam. Water penetration is poor on the #3 fairway because of thatch. How can this problem be corrected. The approach side of #5 green is losing good quality from hard use. How can this loss be corrected without resodding?

Code - 01.0506-03

Title - GREENSKEEPING

OBJECTIVES BY UNIT	CONTENT
Unit 2. Objective #7. Correctly take a soil sample of a green.	A. Taking a soil sample . Time to take test . early spring . Number of subsamples needed . size of area . random sample . Depth of sample (sub samples) . 2 to 3 inches . Mix sub samples of the different areas to get a true reading. B. Tools needed . Soil auger . Trowel . Small spade . Pipe samples . cut-away section
Objective #8. Describe or demonstrate the procedure for applying proper amounts of lime or fertilizer to the satisfaction of the instructor.	A. Selecting and applying fertilizers . Grade . percentage . nitrogen . phosphate . potash . Fertilizer ratio . Types . dry . liquid . Chemical make-up . organic . synthetics . inorganic . Equipment . spreaders . sprayers . Timing . P.h. . problems if below 6.0.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and demonstrate the correct way for taking a soil sample on a green. (After taking the sample fill the hole with a top-dressing and replace turf plug). B. Handout dittos for taking a soil sample (outline procedure)	Student will be able to take a soil sample and determine if the soil is deficient for any one element.	Student will take a soil sample and determine what elements are deficient for a given green to the satisfaction of the instructor.
A. Lecture and demonstrate the correct application of dry and liquid fertilizer. B. Discuss the various methods for applying fertilizers or lime to golf courses. C. Guest speaker from a local golf course.	A. Student will determine the amount of fertilizer or lime to apply to a given area and use the proper equipment to the satisfaction of the instructor. B. Student will be able to calibrate and use a spreader correctly. (Ref #2 Pg. 48) C. Student will practice using a spreader and sprayer.	Performance Test A. Student will select the correct amount of fertilizer or lime to apply to a given area. B. Student will calibrate and apply the fertilizer or lime to the satisfaction of the instructor.

OBJECTIVES BY UNIT	CONTENT
Unit 2 Objective #9. Identify any of the turf diseases, weeds or insects covered in class; and using "Cornell Recommends for Turfgrass", correctly identify a spray control program for same.	A. Identifying and controlling insects, diseases, and weeds for golf courses. . Turf insects . identify . control . Turf diseases . identify . control . Turf weeds . identify . control . Safety . equipment . N.Y. State pesticide regulations
Objective #10. The student will place a cup to the satisfaction of the instructor.	A. Changing the cup . Why moved . frequency . Procedure for changing . cut new hole . lift plug . lift metal liner from old hole . put bottom half of old plug in hole . firm top half of plug in old hole . check 1" depth of rim of metal liner in new hole.

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and use visuals for weeds, insects, and diseases on the overhead projector. B. Demonstrate to class in lab. (point out some diseases, insects and weeds). C. Memo's N.Y. State pesticide regulations (N.Y.S. Dept. of Environmental Conservation, Albany.) D. Demonstrate in lab how to use the equipment and sprays safely.	Students will be able to identify weeds, diseases and insects in school lawn.	Student will take a lab practical to identify weeds, diseases and insects. (Number of each will depend upon the instructor.)
A. Lecture and discuss with class the procedure for changing the cup. B. Demonstrate changing a cup in lab. C. Guest speaker from a local golf course. D. Field trip to a local golf course to observe the procedure for changing a cup.	Student will practice moving a cup in the school lab to the satisfaction of the instructor.	Performance Test . Checklist . cut clearly . correct depth . plug replaced correctly . no heel marks . when finished.

MODULE OF INSTRUCTION

Title - Greenskeeping   Code - 01.0506-03

RESOURCE MATERIALS

Books: Teacher references

1. Turf Management Musser, H. B., New York: McGraw-Hill Book Company, Inc., 1962

2. Turfgrass Maintenance and Establishment. Teachers Manual Penn. State Univ., 1968 (IMS)

Student references

1. Turfgrass Maintenance and Establishment. Student Manual, Penn. State Univ., 1968 (IMS)

Bulletins:

I. Teacher references
   3. Cornell Recommendations for Turfgrass. Cornell Extension Bulletin, (IMS)

   4. Lawn Digest. Stanford Seed Co., P. O. Box 230, Plymouth Meeting, Penn. (35¢)

   5. The Verticut Manual. West Point Products Corp., West Point, Penn.

   7. The Aerator Manual. Rogers Mfg. Co., Olathe, Kansas

II. Student references
   1. Cornell Recommendations for Turfgrass. (See above)

   2. A Guide to Safe Pest Control Around the Home. Cornell Extension Bulletin, S 74 (25¢) (IMS)

Periodicals:

1. Teacher references
   8. Grounds Maintenance. Kansas City, Mo., September 1970 "Mowing Time Study"

MODULE OF INSTRUCTION

Title - Greenskeeping Code - 01.0506-03

RESOURCE MATERIALS

Audiovisuals:

1. Picture Clues to Lawn Troubles. Booklet, (IMS)
2. What's That Weed. Booklet, O.M. Scott & Son, Marysville, Ohio
3. Lawn Care and Management. 46 color slides $8.00 (IMS)
4. Lawn Weed Identification. 39 color slides $6.75 (IMS)
5. Weed Identification. 33 masters $1.00 (IMS)

Other Sources:

1. Toro Mfg. Corp. Minneapolis, Minn. Mower and Irrigation Div.
2. L. R. Nelson Mfg. Co. Inc., Irrigation Div., Peoria, Ill.
3. Ryan Equipment Co., St. Paul, Minn.

MODULE OF INSTRUCTION

Title - CONTROLLING INSECTS, DISEASES AND FERTILIZATION

Code - 01.0599-01

DESCRIPTION:

This module involves the student in identifying the common characteristics of plant injury or disease and the organisms that cause plant damage.

Emphasis is placed on student ability to correctly identify insects, resulting plant damage and select environmentally safe controls. Students learn the proper use of sprayers and dusters in order to distribute chemical controls for plant insect and disease pests. In addition, insect sex attractants and other types of natural controls are considered in the module.

Students enrolled in this module also develop fertilizing programs for ornamental horticultural crops. Using information such as nature of fertilizer components, and types of fertilizers available, students select most appropriate fertilizer for crop requirements and fertilizer application methods.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Identifying insects, selecting and applying controls for greenhouse crops, lawns and nursery plants.	4	8
2. Identifying diseases, selecting and applying controls for greenhouse crops, lawns and nursery plants.	2	5
3. Fertilizers and fertilizer components - their relation to ornamental horticultural crop needs and application methods.	2	9
	8	22

Revised June, 1974

MODULE OF INSTRUCTION

Title - CONTROLLING INSECTS, DISEASES AND FERTILIZATION

Code - 01.0599-01

OBJECTIVES to be obtained:

The student will be able to:

1. Identify 8 of 10 given insect specimens affecting ornamental plants.
2. Given 10 specific insect damaged plant parts, identify cause of damage to not less than 8.
3. Select proper insecticide and control method for given insect problems according to established control methods and insecticide manufacturer specifications.
4. Identify 8 of 10 disease problems common to plants in the nursery, greenhouse, and garden areas.
5. Select proper preventative methods in control of ornamental plant diseases.
6. Determine fertilizer requirements through soil tests for ornamental crops according to specific crop growth requirements.
7. Apply recommended amounts of fertilizer through use of fertilizer spreaders and injectors.

01.0599-01

Title - CONTROLLING INSECTS, DISEASES AND FERTILIZATION

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Identifying insects, selecting and applying controls for greenhouse crops, lawns and nursery plants. Objective #1 Student will be able to visually identify 8 of 10 given insect specimens affecting ornamental plants.	A. Number and types. B. Identification of common insects. C. Slides, cards, mounts of common insect pests affecting ornamental plants.
Objective #2 Given 10 specific insect damaged plant parts, student will be able to identify cause of damage to not less than 8.	A. Common types of ornamental plant injury. B. Student recognition of insect damaged parts.
Unit 2 - Identifying diseases, selecting and applying controls for greenhouse crops, lawns and nursery plants. Objective #3 Student will be able to select and apply proper insecticide and control method for given insect problems according to established control methods and insecticide manufacturer specifications.	A. Range of insecticides available for use on ornamentals. B. Compatibility of insecticides in various ornamental plantings. C. Proper application of insecticides through accurate mixing and safety procedures in handling. D. Natural or biological controls.
Objective #4 Student will be able to identify 8 of 10 disease problems common to plants in the nursery, greenhouse and garden areas.	A. Common diseases for ornamentals - . Floral crops . Nursery crops . Turf areas

EDUCATION

01.0599-01 - Code

CONTROLLING INSECTS, DISEASES AND FERTILIZATION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Lecture and discussion - Text - Nelson pg. 280 B. Visuals of common insects affecting ornamental plants.	A. Students collect and identify 5 insects and damage caused by these insects.	A. Student will be able to visually identify 8 of 10 insect pests affecting ornamental plants.
A. Guest speaker on lawn insects and nursery stock and necessary control measures. B. Field trip to nursery to observe insect control program and effect on sod plantings, large specimen shrubs and trees.	A. Students collect, identify and mount insects and sample of insect damage to ornamental plants.	A. 10 common types of insect caused ornamental plant damage parts are reviewed by students. For each of the damaged parts, students identify insect causing damage.
A. Lecture and demonstration on use of respirator and protective clothing during spray program. B. Demonstration of chemical and steam sterilizer in preventative controls of soil borne insects.	A. Students will identify insects causing plant injury and select appropriate control.	A. Students will safely handle and apply chemical controls after determining causative insect in laboratory setting.
A. Guest speaker and demonstration of common practices of disease control in nursery and sod farms.	A. Students develop their own collection of plant disease problems using plant material in their area.	A. The student will be able to identify not less than 8 of 10 disease problems common to plants in greenhouse, lawns and nurseries.

01.0599-01

Title - CONTROLLING INSECTS, DISEASES AND FERTILIZATION

AGRICULTURA

OBJECTIVES BY UNIT	CONTENT
Objective #5 Student will be able to select proper preventative methods in control of ornamental plant diseases.	A. Conditions promoting diseases. B. How diseases affect plants. C. Identification of specific diseases. D. Preventative controls.
Unit 3 - Fertilizers and fertilizer components - their relation to ornamental horticultural crop needs and application methods. Objective #6 Students will be able to determine fertilizer requirements through soil tests for ornamental crops according to specific crop growth requirements.	A. Use of soil test kits. B. Collection of samples. C. Sending samples to land grant college for analysis.
Objective #7 The student will be able to apply recommended amounts of fertilizer through use of fertilizer spreaders and injectors.	A. Use of dry, granular fertilizer spreaders . Flail type . Gravity feed type B. Use of liquid fertilizer applicators . Hozon type proportioner . Positive displacement proportioner

01.0599-01 - Code

CONTROLLING INSECTS, DISEASES AND FERTILIZATION - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate heat and chemical controls.	A. Each student operate sprayers and sterilizers in control of ornamental plant diseases.	A. For a specific plant disease student will be able to select control.
A. Laboratory review of various fertilizer components. Demonstrate properties and characteristics of various fertilizer components. B. Demonstration of use of soil test kits - proper method of.	A. Each student obtains a representative sample of soil and tests for pH. B. Soil requirements are translated into amounts of fertilizer required for specific soil samples.	A. Each student is given a sample of soil of predetermined pH. B. Using the soil test kit, students determine pH of soil sample and make recommendations for amounts of specific types of fertilizer.
A. Use of dry fertilizer applicators is demonstrated on school laboratory. Methods of applying varying quantities of fertilizer per 1,000 sq. ft. is demonstrated. B. Operation of a 12:1 venture proportioner is demonstrated. C. Positive displacement proportioner use is demonstrated in greenhouse crop fertilization.	A. For a given area students apply 2 lbs. of nitrogen by properly adjusting the amounts of fertilizer delivered. B. Each student mixes a batch of water soluble fertilizer and applies according to crop requirements.	A. For a given area, students should be able to apply a specific amount of fertilizer via either dry or wet fertilizer application methods.

MODULE OF INSTRUCTION

Title - CONTROLLING INSECTS, DISEASES AND FERTILIZATION

Code - 01.0599-01

RESOURCE MATERIALS

A. Books - Kennard S. Nelson. Flower and Plant Production in the Greenhouse. Interstate printers and publishers. $4.75.

Manual California State Poly. Nursery Practices.

B. Bulletins - Co-op Ext. Northeastern Regional Pesticide Co-ordinators Pesticide Information Manual. 1967.
Cornell Ext. Sale Pub. $.10. Common Tree and Shrub Pest with Control Measures.
Cornell Ext. Reprint. Precautions and First Aid Measures for Use in Handling and Applying Insecticides.
Cornell Ext. Bulletin #1175. Fertilizer Proportioners for Horticulture and Nursery Crop Production Management.
Penn State Manual. Bedding Plants.

C. Periodicals - California Chemical Co. (Ortho Div.) San Francisco California. Come with me into the Garden. Sale $.25

D. Audiovisuals -
Teacher made visual insect and insect damage mount.
Film Safe Use of Pesticides. Ag. Ext. Dept. University of California. Davis, California.
Slides Ag. Ed. University of California. Plant Nutrition and Determination of Fertilizer Needs.

MODULE OF INSTRUCTION

Title - PREPARING AND MAINTAINING ORNAMENTAL HORTICULTURE SOILS

Code - 01.0599-02

DESCRIPTION:

This module is concerned with the nature of the soils that are used to produce ornamental horticultural crops. Soil properties considered for this module include particle density, drainage and texture characteristics.

The student is involved in testing soil for the amount of nutrients that are contained within various layers. Each student will obtain a composite soil sample and use special dyes to determine acidity of soil.

The module also provides instruction in methods of mixing peat moss, sand and other inert materials to produce artificial soil mixes for flower, turf and shrub crops.

This module also includes instruction in steam and electric sterilization of soils to be used in the greenhouse and fumigation of soils in turf and nursery crop production.

Instruction is also provided in the operation of roto-tillers and hand tools, necessary to prepare soils for planting as well as properly maintain established plantings.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	 Other
1. Testing soil for physical and chemical suitability for ornamental crops.	2	7
2. Tilling and mixing soil in greenhouse benches, lawn and nursery areas with hoes, hand cultivators and power roto-tillers.	1	7
3. Sterilizing greenhouse soils with steam, electrical and fumigant techniques.	2	11
	5	25

Revised June, 1974

MODULE OF INSTRUCTION

Title - PREPARING AND MAINTAINING ORNAMENTAL HORTICULTURE SOILS

Code - 01.0599-02

OBJECTIVES to be obtained:

The student will be able to:

1. Demonstrate an understanding of the importance of soils by -

    A. Listing five uses of soil -

    B. Describing the four roles or purposes of soil in greenhouse and nursery use to hold water, supply nutrients, support plants, etc.

2. Demonstrate a knowledge of the nature and properties of soil by correctly classifying five types of soil under the categories of color, texture, organic matter content in the field setting.

3. Prepare a given soil for planting ornamentals by use of common cultivation equipment.

4. Add proper soil building constituents in adequate quantities to prepare soils for indoor and outdoor applications.

5. Mixing artificial soil constituents in correct proportion through use of shovels, wheelbarrows and cement mixers.

6. Fumigate and sterilize soils by proper use of chemical and heating treatments.

01.0599-02

Title - PREPARING AND MAINTAINING ORNAMENTAL HORTICULTURE SOILS

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Testing soil for physical and chemical suitability for ornamental crops. Objective #1 Demonstrate an understanding of the importance of soils by: A. Listing five uses of soil B. Describing the four roles or purposes of soil in greenhouse and nursery use to hold water, supply nutrients, support plants, etc.	A. List of uses or soils in horticultural areas such as garden centers, greenhouses, nurseries and turf grass production operations. B. Importance of soil in the various ornamental horticultural enterprises. Various factors such as soil constituent cost, ease of handling freedom of disease organisms and growing conditions are taken into consideration.
Objective #2 Demonstrate a knowledge of the nature and properties of soil by correctly classifying five types of soil under the categories of color, texture, organic matter content in the field setting.	A. Compare sandy and clay soils B. Test for particle density test C. Compare drainage of various texture soils D. Fertility E. Components of soil
Unit 2 - Tilling and mixing soil in greenhouse benches, lawn and nursery areas with hoes, hand cultivators and power roto-tillers. Objective #3 Prepare a given soil for planting ornamentals by use of common cultivation equipment.	A. Use of hand tools for working soil B. Use of roto-tillers for cultivation and tillage C. Plowing

EDUCATION

01.0599-02 - Code

PREPARING AND MAINTAINING ORNAMENTAL HORTICULTURE SOILS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Present a slide series on various uses of ornamental horticulture soils. B. Walk through school greenhouse and demonstrate importance of various soils.	A. Students tour a local ornamental horticulture business to determine the uses of ornamental horticulture soils and important roles of soils.	A. Students are asked to orally describe five uses of soils in ornamental horticulture and four roles or purposes of soils.
A. Do a particle density comparison test in class. B. Fill 4 inch pots with different types of soil and media. Pour the same amount of water in each and collect and measure the water that runs through the pot.	A. Have each student do a particle density test. B. Have each student do a drainage test on various soils.	A. In the laboratory, students are able to differentiate between clay, sand and organic portions of soils.
A. Demonstrate proper use, maintenance, and storage of tools and equipment used. B. Demonstrate how to mix soil correctly. C. Emphasize safety.	A. Mix soil manually on potting bench and with a soil mixer. B. Hand hook a greenhouse bench. C. Use a roto-tiller to till a raised bench and a ground bench. D. Use a roto-tiller to cultivate nursery. E. Use a moldboard plow. F. Apply proper amount of organic matter.	A. Students use two of the soil tillage methods in the laboratory to demonstrate level of skills development.

Title - PREPARING AND MAINTAINING ORNAMENTAL HORTICULTURE SOILS

OBJECTIVES BY UNIT	CONTENT
Objective #4 Add proper soil building constituents in adequate quantities to prepare soils for indoor and outdoor applications.	A. Grow manure crops such as rye B. Addition of leaf mulches, peat moss. C. Addition of topsoils.
Objective #5 Mixing artificial soil constituents in correct proportion through use of shovels, wheelbarrows and cement mixers.	A. Types of soils (Cornell - peat-lite) B. Applications for various ornamental horticultural soil mixes - - Weight factor - Nutrient Retention - Plant response C. Use of mixers in proportioning soils
Unit 3 - Sterilizing greenhouse soils with steam, electrical and fumigant techniques. Objective #6 Fumigate and sterilize soils by proper use of chemical and heating treatments.	A. Types of soil fumigants - (Vapan) B. Application methods for soil fumigants. C. Steam generators and steam from permanent boiler installations - Use of tarp in steaming bench soils - Length of time for steaming greenhouse bench soils D. Soil pastuerization through electric heating devices.

EDUCATION 01.0599-02 - Code

PREPARING AND MAINTAINING ORNAMENTAL HORTICULTURE SOILS - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Demonstrate effect of different soils on plant growth. Soils with little ion exchange capacity	A. Each student adds peat moss to a given soil mixture. B. Students seed an open area with a green manure crop.	
A. Demonstrate method of using shovel to measure soil constituents when mixing with concrete mixer.	A. Each student should select a soil mix for a given crop and prepare a sample of the mixture.	A. From a given selection of soil constituents, each student will prepare an artificial soil mix.
A. Samples of fumigant material are applied to given areas of a greenhouse bench to demonstrate effectiveness. B. A portable steam generator or permanent boiler unit is operated for students to see technique of steam application. C. A batch of soil is pasteurized in the laboratory by use of an electric soil pastuerizer.	A. Each student prepares soil for planting one specific crop - selecting soil sterilization, pasteurization process appropriate for the given type of crop to be produced.	A. Fumigation or heat sterilization processes are effectively carried out by students for a given cropping situation.

MODULE OF INSTRUCTION

Title - PREPARING AND MAINTAINING ORNAMENTAL HORTICULTURE SOILS   Code - 01.0599-02

RESOURCE MATERIALS

A. Books - Ball Red Book. George D. Ball Co., Chicago, Illinois
Soils and Soil Fertility
Using and Managing Soils - Thompson

B. Bulletins - Cornell Ext. Bulletin 635 - An Efficient, Labor Saving Method of Steaming Soil
Cornell Recommends - Cornell Ext. Bulletin - Sterilization - Methods and Soil Treatment
Cornell Information Bulletin 43 - Cornell Peat-Lite Mixes for Commercial Plant Growing
Cornell Recommendations for-Turfgrass
Commercial Production of Trees and Shrubs
Commercial Production of Azaleas
Commercial Production of Chrysanthemums
Commercial Production of Geraniums
Commercial Production of Lilies

MODULE OF INSTRUCTION

Title - USING WOODY PLANTS IN ORNAMENTAL HORTICULTURE

Code - 01.0599-03

DESCRIPTION:

The knowledge of common characteristics and uses of woody plants in landscaping grounds provides the basis for developing landscape plans for existing and planned building sites.

Students learn the basic terminology for plant parts necessary to identify plants with an identification key and on sight. Also students learn the characteristics of woody plants, which is essential for their proper landscape use.

Laboratory activities will take place in the school land laboratory and near-by gardens and park areas.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Basic types of woody plants	1	
2. Identification of plant parts using proper nomenclature	4	3
3. Identification of Woody Plants	5	7
4. Landscape Characteristics	1	9
	11	19

Revised June, 1974

MODULE OF INSTRUCTION

Title - USING WOODY PLANTS IN ORNAMENTAL HORTICULTURE Code - 01.0599-03

OBJECTIVES to be obtained:

The student will be able to:

1. State on a written or oral quiz the difference between deciduous and evergreen trees and shrubs, narrow leaf and broadleaf evergreens.

2. When given a dormant deciduous branch, list on a written or oral quiz each part using proper nomenclature.

3. When given a branch in leaf state on a written or oral quiz:

   . The type of leaf arrangement
   . If the leaves are simple or compound
   . If the leaves are compound, whether they are pinnately compound, or palmately compound.
   . All the parts of the leaf, whether it be a simple or compound leaf.

4. Identify on a written or oral quiz -

   . Seven out of ten leaf shapes
   . Five out of six leaf apices
   . Five out of six leaf margins

5. Using a dichotomous plant identification key, identify nine out of ten samples on a written or oral quiz.

6. If given a branch of each of 30 different species of woody plants, identify 25, stating both common and botanical names orally, or in writing.

7. When given a list of twenty-five woody plants on an oral or written quiz the value or characteristic of each in the following landscape value categories with 70% accuracy.

   . Hardiness
   . Seasonal interest
      . fruit i.e., color, texture
      . fall color
      . flower
   . Foliage
      . deciduous, narrow leaf or broad leaf evergreen
      . color, texture, etc.
   . Size of group
   . Shape
   . Site considerations
   . Slow or fast growing
   . Peculiarities
   . Functions or uses
   . Maintenance
   . Other

01.0599-03

Title - USING WOODY PLANTS IN ORNAMENTAL HORTICULTURE

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Basic types of woody plants Objective #1 Each student should be able to state on a written or oral quiz the difference between: . Deciduous and evergreen trees and shrubs . Narrow leaf and broadleaf evergreens	A. Deciduous trees and shrubs B. Evergreen trees and shrubs C. Narrow leaf evergreens D. Broadleaf evergreens
Unit 2 - Identification of plant parts using proper nomenclature Objective #2 Each student when given a dormant deciduous branch should be able to list on a written or oral quiz all parts using proper nomenclature.	A. Terminal bud B. Lateral or axillary bud C. Budscale D. Stipular line E. Lenticels F. Leaf scar G. Bundle scar H. Bud scale scar I. Pith J. One years growth K. Node L. Internode
Objective #3 Each student when given a branch in leaf should be able to state on a written or oral quiz: . The type of leaf arrangement . If the leaves are simple or compound	A. Opposite leaf arrangement B. Alternate leaf arrangement C. Whorled leaf arrangement A. Simple leaves B. Compound leaves

EDUCATION

01.0599-03 - Code

USING WOODY PLANTS IN ORNAMENTAL HORTICULTURE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Show students dormant deciduous trees or shrubs and evergreen trees or shrubs and explain difference. B. Show students narrowleaf evergreen and broad leaf evergreen and explain difference.	A. Students take notes	A. Written or oral quiz in field or classroom.
A. Give each student a fill in ditto sheet of dormant deciduous twig with arrows pointing to parts of interest. B. Give each student a hand lens and dormant deciduous twig in order for him to locate part being discussed. C. Point to each part of twig to be learned and write term on board. D. Assist students in finding plant part on their specimen.	A. Students locate part of twig being discussed. B. Students fill in ditto.	A. Written or oral quiz in field or classroom.
A. Using actual specimen in classroom or field point out different leaf arrangements.	A. Students take notes.	A. Written or oral quiz in field or classroom.
B. Using actual specimens in classroom or field point out differences between simple and compound leaves	B. Students take notes.	B. Written or oral quiz in field or classroom.

01.0599-03

Title - USING WOODY PLANTS IN ORNAMENTAL HORTICULTURE

OBJECTIVES BY UNIT	CONTENT
Objective #3 . If the leaves are compound whether they are pinnately compound or palmately compound.	A. Pinnately compound leaves B. Palmately compound leaves
. All the parts of the leaf, whether it be simple or compound.	A. Simple leaf . Blade . apex . base . Midrib . Margin . Petiole . Stipule B. Pinnately compound leaf . Leaflet . Petiolule . Petiole . Rachis . Stipule C. Palmately compound leaf . Leaflet . Petiolule . Petiole . Stipule
Objective #4 Each student should be able to identify on a written or oral quiz: . Seven out of ten leaf shapes.	A. Linear B. Oblong C. Elliptic D. Ovate E. Obovate F. Lanceolate G. Oblanceolate H. Spatulate I. Orbicular J. Reniform

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Show students a pinnately compound leaf and a palmately compound leaf. B. Diagram each on blackboard.	A. Students copy diagram on blackboard.	A. Written or oral quiz in field or classroom.
A. Diagram simple leaf on blackboard and label all its parts. B. Using diagrams made on blackboard from c (above) label all parts. C. Take students in to field or bring specimen into class and go over all parts of simple, pinnately compound, and palmately compound leaves.	A. Students take notes.	A. Written or oral quiz in field or classroom.
A. Handout fill in ditto with ten leaf shapes sketched in and take field trip to show student actual specimens of leaf shapes. B. Students fill in ditto sheets while observing leaf shapes on field trip.	A. Students fill in ditto sheet. B. Students make leaf collection demonstrating 10 leaf shapes.	A. Written or oral quiz in field or classroom.

OBJECTIVES BY UNIT	CONTENT
Objective #4 . Five out of six leaf bases.	A. Cuneate B. Attenuate C. Cordate D. Oblique E. Rounded F. Truncate
. Five out of six leaf apices.	A. Acute B. Acuminate C. Mucronate D. Obtuse E. Retus F. Emarginate
Unit 3 - Identification of Woody Plants Objective #5 Each student, using a dichotomous plant identification key, should be able to identify 9 out of 10 plant samples on a written or oral quiz.	A. Dichotomous plant identification key.

01.0599-03 - Code

USING WOODY PLANTS IN ORNAMENTAL HORTICULTURE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Hand out fill in ditto with six leaf bases sketched in. B. Bring actual leaf specimens into class demonstrating six leaf bases. C. Go over with class writing names for six leaf bases on board.	A. Students fill in ditto. B. Students make leaf collection demonstrating six leaf bases.	A. Oral or written quiz in field or classroom.
A. Hand out ditto with six leaf apices sketched in. B. Bring actual leaf specimens into class demonstrating six leaf apices. C. Go over with class writing names for six leaf apices on board.	A. Students fill in ditto sheet. B. Students make leaf collection demonstrating six leaf apices.	A. Oral or written quiz in field or classroom.
A. Bring plant samples into class and key out several while having class follow along. B. Have students individually key out several more. C. Take students into field and have them key out plants.	A. Students key out plants with dichetomous plant identification key.	A. Take students into field or bring plant specimens into class, provide students with plant identification key and have them key out plants.

OBJECTIVES BY UNIT	CONTENT
Objective #6 Each student if given a branch of each of 30 different species of woody plants should be able to identify 25, stating both common and botanical names orally, or in writing.	A. Identifying characteristics of 30 different species of woody plants.

Unit 4 - Landscape Characteristics
Objective #7
Each student when given a list of 25 woody plants on an oral or written quiz should be able to state the value or characteristic of each in the following landscape value categories with 70% accuracy.
	A. Landscape values
	. Hardiness
	. Seasonal interest
	  . fruit . flower
	  . fall color
	. Foliage
	  . deciduous, narrow leaf or broadleaf evergreen.
	  . color, texture, etc.
	. Size group
	. Shape
	  . ovate . pyramid
	  . obovate . conical
	  . globose . broad columnar
	  . broader than high . narrow columnar
	  . irregular
	. Site considerations, i.e. moist, fertile well drained soil
	. Slow or fast growing
	. Peculiarities, i.e. disease problem - cedar apple rust
	. Functions or uses
	  . shade tree . street tree
	  . specimen plant . hedge
	  . barrier (visual or windbreak) . espalier
	. Maintenance
	. Other i.e. bark

01.0599-03 - Code

EDUCATION

USING WOODY PLANTS IN ORNAMENTAL HORTICULTURE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Hand out fill in ditto sheets including diagrams of each twig. Each twig diagram should be accompanied by short descriptive paragraph pointing out most important identifying characteristics. Blanks should be left in paragraph with key words should be filled in by students. B. Bring plant specimens into class for students to observe while filling in dittos. C. Field trips to identify plants outdoors.	A. Students should observe specimens in class and plants outdoors. B. Students fill in dittos.	A. Written or oral quiz in field.
A. Handout landscape value ditto sheets. These sheets are to be filled in by students. They consist of each of the landscape values mentioned followed by a blank. B. Explain terminology in class. C. Take students into field to observe and record landscape values of particular plants being studied.	A. Students fill in landscape value ditto sheets.	A. Oral or written quiz.

MODULE OF INSTRUCTION

Title - USING WOODY PLANTS IN ORNAMENTAL HORTICULTURE Code - 01.0599-03

RESOURCE MATERIALS

1. Wyman, D. 1965 Trees for American Gardens, MacMillan Co. N.Y.
2. Wyman, D. 1969 Shrubs and Vines for American Gardens, MacMillan Co. N.Y.
3. A list of Ornamental Plants for New York Seashores - Cornell Bulletin 1 B59 - $.15 - Source: Mailing Room Building 7, Research Park, Cornell University, Ithaca, New York 14850.
4. Culture of Rhododendrons in New York State (Lieberman and Pridham) - Cornell Bulletin E1071 - $.15 Source: See #3 above.
5. Trees for the Home Grounds (Mower, Scannell, and Lieberman) Cornell Bulletin E1096 - $.15 - Source: Same as #3 above.

A SUGGESTED LIST OF 25 WOODY PLANTS

1. *Acer platanoider*
2. *Acer saccharinum*
3. *Acer saccharum*
4. *Berberis thunbergii*
5. *Forsythia ovata*
6. *Syringa vulgaris*
7. *Philadelphus coronarius*
8. *Cornus florida*
9. *Ligustrum ovalifolium*
10. *Lonicera fragrantissima*
11. *Quercus palustrus*, Quercus sp.
12. *Taxus cuspidata*
13. *Taxus cuspidata capitata*
14. *Jeiniperus pfiteriana*
15. *Platanus acerifolium*
16. *Gleditsia triacanthos*
17. *Kolkwitsia amabilis*
18. Rhododendron sp.
19. *Betula papyritera*
20. *Cencis canadensis*
21. *Tilia cordata*
22. *Prunus subhirtella*
23. Pinus sp.
24. Malus sp.
25. *Euonymous elatus*

MODULE OF INSTRUCTION

Title - DEVELOPING AN ORNAMENTAL BUSINESS LOCATION AND LAYOUT

Code - 01.0599-04

DESCRIPTION:

This module involves students in the assessment of factors that are responsible for success in the retail florist or nursery business. Students select various locations in their community that would be suitable for a retail florist or nursery business based on: traffic patterns, costs of land, tax rates and costs of building.

The interior of the retail florist and nursery shops are planned by students according to prime use of the area. Students planning interior layouts and sales areas adjacent to the retail building must plan for features such as refrigeration space, work areas and retail display areas.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	**Other**
1. Planning store layouts for the retail flowershop, retail nursery and garden center.	3	20
2. Redesigning and improving shop layout for greater efficiency and salesability	1	6
	4	26

Revised June, 1974

MODULE OF INSTRUCTION

Title - DEVELOPING AN ORNAMENTAL BUSINESS LOCATION AND LAYOUT

Code - 01.0599-04

OBJECTIVES to be obtained:

The student will be able to:

1. Identify a retail business operation and determine whether it is a nursery, flower shop, garden center or combination.
2. Identify the specific needs of a successful retail flower shop, nursery business or garden center such as prime location, traffic patterns, window display areas, existing buildings, rate of taxes in given area, fire, and police protection and future expansion patterns for area.
3. Identify the needs of a combination of the two businesses under one enterprise.
4. Layout an ornamental business, both interior and exterior.

Title - DEVELOPING AN ORNAMENTAL BUSINESS LOCATION AND LAYOUT

OBJECTIVES BY UNIT	CONTENT
Unit 1 - Planning store layouts for the retail flower shop, retail nursery and garden center. Objective #1 The student will identify a retail business operation and determine whether it is a nursery, flower shop, garden center or combination.	A. Retail flower shop B. Retail nursery C. Retail flower shop and nursery D. Garden Center
Objective #2 Identify the specific needs of a successful retail flower shop, nursery business or garden center such as prime location, traffic patterns, window display areas, existing buildings, rate of taxes in given area, fire, and police protection and future expansion patterns for area.	A. Location of shop . Sales potential of area . Competition . Traffic patterns . Buying buildings versus rental of building . Insurance rates . Fire and police protection . Expansion potential . Tax rates B. Interior layout - Flower shop . Counterspace . Display refrigerator . Work areas . Display of saleable hard goods . Office areas . Other

EDUCATION 01.0599-04 - Code

DEVELOPING AN ORNAMENTAL BUSINESS LOCATION AND LAYOUT. - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Field trips - to selected business establishments. B. Slides - (series shown by county agent as guest speaker).	A. Student will identify two types of retail ornamental horticulture businesses.	A. Students identify type of retail ornamental horticulture business based on a list of products that are retailed.
A. Contact local county agents for all available information on existing retail businesses in area being considered in establishing a business. Also obtain accurate data on road and traffic patterns is available. B. Assemble all materials and duplicate for student's own use. C. Film and slides - showing locally established businesses and sites for ornamental business layouts (source - county agent D. Have insurance and tax data available for student's use. E. "Florist Exchange" magazine.	A. Student will identify sales potential of area. B. Student will identify the importance of window displays. C. Student will identify the importance of parking areas and delivery areas. D. Student will identify the amount of space needed for various work areas, display areas in interior of building. E. Student will become familiar with how insurance rates are determined and how tax rates are determined. F. Student will be able to figure out cost analysis for both owning a basic layout or renting same. G. Given three basic buildings-student will design an exterior layout for each. . To be located in a higher income area . To be located in a middle income area. . To be located in a lower income area.	A. Students identify the critical factors necessary for effective business layout in flower shops, nurseries and garden centers. Interior and exterior areas are listed for each business.

OBJECTIVES BY UNIT	CONTENT
Objective #2 (continued)	C. Interior layout - Nursery . Counter space for selling . Work areas . Display areas for sale of: . hand tools - trowels, pruning shears, etc. . decorative lawn accessories . small quantities of fertilizers, peat, potting soil, etc. . Area devoted to indoor display of use of ornamentals . Area devoted to consultation . Office area D. Exterior layout - Flower shop . Entrance to shop . Window space . Lighting . Style or design of shop . Parking E. Exterior layout - Nursery . Basic same as above . Outdoor growing area . Outdoor sales area . Walkways . Pick-up area . Storage area for equipment F. Cost analysis . Own . Rental

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Objective #2 (continued)	H. Student will visit retail flower shops and nurseries to study exterior and interior layouts. I. Student given same basic buildings layouts and will complete an interior layout, showing display areas, cooler areas, retail sales areas, work areas, delivery areas. J. Have student figure cost analysis sheet for constructing a building, as well as basically equipping the same building - all necessary costs and price information must be made available to student.	

Title - DEVELOPING AN ORNAMENTAL BUSINESS LOCATION AND LAYOUT

OBJECTIVES BY UNIT	CONTENT
Objective #3 Identify the needs of a combination of the two businesses under one enterprise.	A. Exterior layout for both types of businesses (see basic layout - Unit #2) B. Define each area according to the business that is being carried on each i.e.: . Bedding plant area . Ornamental area . Floral design area . Walk-ways and driveways
Unit 2 - Redesigning and improving shop layout for greater efficiency and salesability Objective #4 Layout an ornamental business, both interior and exterior.	A. Exterior . Improving or adding on to existing building . Additional parking facilities . Cost of renovation B. Interior . Additional work areas . Amount of increased production that can be anticipated . growth of area . volume of sales . Number and cost of additional employees needed

EDUCATION 01.0599-04 - Code

DEVELOPING AN ORNAMENTAL BUSINESS LOCATION AND LAYOUT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Have model shop set up (suggest woodworking shop might assist) with basic layout. B. Students can design and redesign or relocate parts or all of the shop to develop a realistic layout. C. Have students observe and evaluate each plan.	A. Student will be able to incorporate basic layouts for the two businesses under one establishment. B. Student will be able to recognize the necessity of keeping sales areas and work areas for each business easily accessible for customer and sales personnel to more efficiently use. C. Student will visit area combination retail nursery and flower shop businesses to identify the layout. D. Student will develop a basic interior and exterior layout for a combined business operation and complete cost analysis.	A. Students will be able to draw up a combination floor plan related to the type of materials that will be retailed.
A. Reinforce teaching techniques of basic layout. B. Slides - taken by teacher of various desirable and undesirable exterior and interior views of nurseries. . "American Nurseryman" . "Florist Exchange" C. Students should be aware of and encouraged to read and perhaps report to class mates any current articles.	A. Student will be able to identify the basic needs of an efficient, well planned improvement project. B. Student will be able to identify increased sales volume as a result of enlarging or renovating an existing layout to meet needs of industry. C. Student will develop a layout which is already in existence indicating current facilities and then indicating renovations and/or additions that will be added. D. Complete cost analysis. E. Complete chart on anticipated increase retail sales to be realized upon completion of project.	A. Students can assess areas of existing business that are reducing profitability. Alternative floor layouts are submitted to replace inefficient set ups.

MODULE OF INSTRUCTION

Title - DEVELOPING AN ORNAMENTAL BUSINESS LOCATION AND LAYOUT   Code - 01.0599-04

RESOURCE MATERIALS

A. Books - Pennsylvania State University - Retail Flower Shop Operation and Management - (Student and Teacher supplements)

Pinney - Operating a Garden Center - (Student and Teacher Supplements) 1963 - $3.50

B. Bulletins - Assessment of Real Estate - Cornell - 1961 - E 1041

Driveways and Sidewalks - Cornell - E 693

C. Periodicals - "American Nurseryman" - monthly 343 S. Dearborn St., Chicago, Illinois 60604

"Florist Exchange" - monthly 434 S. Wabash Ave., Chicago, Illinois 60605

"Florist" - monthly

D. Audiovisuals - Slide Series - From local county agent in your own area.

MODULE OF INSTRUCTION

Title - PREPARING NURSERY STOCK FOR SALE Code - 01.0599-05

DESCRIPTION:

In this module, the students will prepare nursery stock for marketing. They will dig, ball and burlap, grade and display conifer and deciduous nursery stock. Much time will be spent in the nursery on "learning by doing" activities.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocation Class	Time Allocation Other
1. Digging nursery stock	3	7
2. Grading nursery stock	3	5
3. Displaying nursery stock	4	6
4. Transporting stock	1	1
	11	19

Revised June, 1974

MODULE OF INSTRUCTION

Title - PREPARING NURSERY STOCK FOR SALE   Code - 01.0599-05

OBJECTIVES to be obtained:

The student will be able to:

1. Dig bare root ornamental stock.
2. Ball and burlap ornamental stock.
3. Dig and transplant stock to containers.
4. Identify, select and use containers for container grown stock.
5. Grade deciduous and conifer nursery materials according to nursery trade grades.
6. Tag and display nursery stock.

Code - 01.0599-05

Title - PREPARING NURSERY STOCK FOR SALE

OBJECTIVES BY UNIT	CONTENT
1. Digging nursery stock Objective #1 Dig bare root ornamental stock. Objective #2 Dig, ball and burlap ornamental stock.	A. Bare root stock • Types of stock • Digging equipment • Preparing plants • Digging and storing plants B. Ball and burlap stock • Types of stock • Digging equipment and supplies • Preparing plants • Dig, ball and burlap C. Dig and transplant container grown stock
Objective #3 Dig and transplant stock to containers.	Repeat A, B & C above.
Objective #4 Identify, select and use containers.	A. Containers . Plastic containers . Clay pots . Paper containers . Asphalt containers

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Discussion based on nursery catalog. B. Demonstrate - • Select equipment for digging • Prepare and dig plants bare root	A. Look through nursery catalogs and list types and examples of stock sold bare root. B. Dig whatever small shrub and tree deciduous stock is available in nursery.	A. Dig bare root stock to satisfaction of local industry standards.
A. Discussion based on nursery catalog. B. Demonstrate - • Selecting equipment and supplies • Preparing plants • Dig, ball and burlap stock (include tying and root pruning).	A. Look through nursery catalog to list types and examples of stock sold bare root. B. Dig small conifer and larger deciduous trees, ball and burlap them (including tying and root pruning).	A. Dig ball and burlap stock to industry standards.
A. Discussion of container display. B. Demonstration of transplanting stock to container.	A. List container types, the advantages and uses of each. B. Transplant stock into containers.	A. Dig and transplant stock to containers according to local industry standards.
A. Discussion of different types of containers.	A. Student will transplant at least one nursery stock plant into each of the containers (plastic, clay, paper, asphalt).	A. Each plant transplanted will be transplanted according to the hand out sheet provided by the instructor.

Code - 01.0599-05

AGRICULTURAL

Title - PREPARING NURSERY STOCK FOR SALE

OBJECTIVES BY UNIT	CONTENT
2. Grading nursery stock Objective #5 Correctly grade bare root, and container grown stock	A. Determine grade standards for - . Bare root deciduous shrubs . Bare root deciduous trees . Balled and burlapped deciduous trees . Balled and burlapped conifers . Roses
3. Displaying nursery stock Objective #6 Tag and display shrubs, trees, and bedding plants.	A. Identify those merchandising techniques which apply especially to growing plants - . Have healthy produce . Attractive container . Correctly tagged as to variety and price . In full view and reach . Simple self-service . Plants maintaining - water, light . Plant information and advice available
4. Transporting stock Objective #6	A. Transporting stock • Hand cost • Wheel barrow • Tractor drawn wagon

EDUCATION

01.0599-05 - Code

PREPARED NURSERY STOCK FOR SALE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Field trip to local nursery . See examples of each type of stock . Study nursery displays and describe specific qualities of each grade B. Read and discuss nursery stock standards N.Y.	A. Student observe and note specific qualities of each grade of each type of stock. B. Complete list from standards handbook. C. Student grade various types of stock on field trip - or at school nursery.	A. Written or oral test in which student lists major grade standards of top grades of each class of stock. B. Correctly grade samples of each kind of stock.
A. Field trip to a good local garden center. B. Demonstrate cleaning, tagging and displaying of nursery stock - . Bare root shrubs . Bare root trees . Balled and burlapped stock C. Demonstrate proper preparation of a tag. D. Discussion of students' observations on field trip to garden center.	A. List effective and poor techniques observed on trip - . The product . Container . Labeling . Self-service B. Prepare plants (of each type) for display and sale - in a retail sale area of school - . Clean up the plant and container . Identify, price and tag plants . Display plants for sale . Maintain plants in sales area	A. Written or oral test in which student lists descriptive qualities of a good salable nursery product. B. Correctly tag a product as to variety, description and price. C. Prepare a small display - or part of a large display of nursery plants. D. Go through a successful retail sale of a nursery plant.
A. Demonstration and discussion of methods of transporting stock.	A. Student will transport nursery stock using each of the methods listed.	A. The student will load and transport the nursery stock without damaging the plant.

MODULE OF INSTRUCTION

Title - PREPARING NURSERY STOCK FOR SALE   Code - 01.0599-05

RESOURCE MATERIALS

Books -

1. Nursery Production and Management (Handbook for Students and Teacher). Penn State University.
2. Flower and Plant Production - Nelson, Kehhard S. Interstate Printers and Publishers, Dansville, Illinois 61832
3. The Nursery Manual - Liberty Hyde Bailey.
4. The Ball Red Book (George J. Ball Staff) 1965 (for selling bedding plants).

Bulletins -

1. Thompson, Robert A. - Transplanting Trees and Other Woody Plants U.S. Government Printing, Washington, D.C.
2. Bushey, Donald J. - Planting and Care of Shrubs and Trees.

Periodicals -

1. The Nursery Business.

Audiovisuals - None

MODULE OF INSTRUCTION

Title - OPERATION AND MAINTENANCE OF HORTICULTURAL EQUIPMENT

Code - 01.0599-06

DESCRIPTION:

This module places emphasis upon the safe operation of commonly used ornamental horticultural equipment.

Students are involved in the safe operation of turf equipment, operation of garden tractors, back hoes, bulldozers and greenhouse equipment such as ventilation systems and fertilizer injection systems.

In addition students perform minor adjustments and maintenance operations of ornamental horticulture equipment. Adjustment of cutting height, ratio settings in fertilizer proportioning systems and checking belt tensions in lawn and garden equipment are some of the operations performed by students taking this module.

UNITS OF CONTENT	Time Allocations	
	Class	Other
1. Operation of the common types of ornamental horticultural equipment.	2	13
2. Adjustment of ornamental horticultural equipment.	2	13
	4	26

Revised June 1974

MODULE OF INSTRUCTION

Title - OPERATION AND MAINTENANCE OF HORTICULTURAL EQUIPMENT Code - 01.0599-06

OBJECTIVES to be obtained:

The student will be able to:

1. List the proper names of all pieces of equipment studied with 90% accuracy.
2. Make recommended minor adjustment on common gasoline and electric power supplies for horticultural equipment so that the equipment will function as close to manufacturer's specifications as possible.
3. Maintain and adjust given chain, belt and gear drives so that the equipment will operate as close as possible to manufacturer's specifications.
4. Identify and name devices which require periodic adjustment and be able to make the adjustment so as to achieve maximum efficiency from the particular piece of equipment.
5. Regulate or guide a particular piece of equipment in order to obtain the maximum end results.

Code - 01.0599-06

AGRICULTURAL

Title - OPERATION AND MAINTENANCE OF HORTICULTURAL EQUIPMENT

OBJECTIVES BY UNIT	CONTENT
Unit 1 Operation of the Common Types of Ornamental Horticultural Equipment Objective 1 Types and proper names of equipment encountered.	A. Turf equipment i.e. mowers, verticut. B. Nursery equipment i.e. small tractor, rototiller. C. Landscape equipment i.e. truck, back hoe, bulldozer, chain saw. D. Greenhouse equipment i.e. ventilation fans, sprayer, fertilizer injector, heating units.
Objective 2 The power supply	A. 4 cycle engine B. 2 cycle engine C. Electric motor
Unit 2 Adjustment of Ornamental Horticultural Equipment Objective 3 Chain, belt and gear drives	A. Chain . Lubrication . Adjustment . Repair and replace B. Belt . Adjustment . Dressing . Replacement (when and how) C. Gear drives . Lubrication . Synchronization
Objective 4 Preparing to operate	A. Checking fluid levels and correcting them B. Choking C. Cranking D. Safety E. The operator

01.0599-06 - Code

OPERATION AND MAINTENANCE OF HORTICULTURAL EQUIPMENT - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Use actual pieces of equipment where possible, and catalogs displaying the equipment.	To associate a particular piece of equipment with its common name.	The student will become familiar with equipment that you have available. The student will perform a special project involving the use of at least one piece of equipment: clear a recreation area of fallen trees using a chain saw.
Choose pieces of equipment that use each power supply mentioned and explain why it is used there and why you could or could not use another power source.	To understand the basic principles behind the function of the particular power source. Make minor adjustments to improve operation of machine. Maintenance of fuel and oil supplies.	From the power supplies available, have the students make a list of horse power ratings, R.P.M. rates, etc. Adjust engines and motors for various types of field conditions. Proper methods of fueling and oiling specific machines.
An actual demonstration in each drive adjustment.	To be able to determine a problem in the drive and correct it.	Have the student adjust, remove, replace and lubricate appropriate drive components.
Using the owners' manual as a guide, demonstrate each operation.	To put the machine and operator in condition to operate as a unit.	Have the students prepare pieces of equipment to operate.

Code - 01.0599-06

AGRICULTUR

Title - OPERATION AND MAINTENANCE OF HORTICULTURAL EQUIPMENT

OBJECTIVES BY UNIT	CONTENT
Unit 2 - Continued Objective 5 Operation	A. Safety B. Engaging and disengaging moving parts C. Most effective rate of speed D. Efficient operation E. Cleaning and storage

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
Put each machine to be used through its complete cycle of operation. Point out problems that are most likely to occur. Emphasize the use of safety equipment in: safety glasses, hard hats, steel toed shoes.	Operate equipment effectively, efficiently, and safely.	Have students operate all equipment applicable. Before any piece of equipment is operated a full safety inspection of the piece of equipment shall be made and reported to the instructor. This inspection includes inspection of moving parts such as: wheels, blades, belt and chains. Check oil, water gas and gauges. Any discrepancy shall be reported to the instructor.

MODULE OF INSTRUCTION

Title - OPERATION AND MAINTENANCE OF HORTICULTURAL EQUIPMENT   Code - 01.0599-06

RESOURCE MATERIALS

A. Books -

Owners Manual of Various Machines

Tractor Maintenance

Pluvis, J., All About Small Gas Engines, Homewood, Illinois 1963-

Small Engine Service Manual, Kansas City 5, Missouri:

Technical Publications, Inc. 1966

B. Bulletins -

Cornell. Electric Motor Protection and Control. E 763

C. Periodicals -

Florist Nursery Exchange
343 So. Dearborn Street
Chicago, Illinois 60604

Farm Safety Review.

D. Audiovisuals -

MODULE OF INSTRUCTION

Title - SCHEDULING GREENHOUSE CROP PRODUCTION Code - 01.0599-07

DESCRIPTION:

In this module the students will make decisions which have extreme importance in determining profitability of a greenhouse flower growing business.

Students will select specific crops to be raised, keeping in mind the local flower markets, holiday and seasonal demands and flower production schedules. They will utilize various production practices affecting greenhouse crop growing schedules. Students will spend nearly half of their time working with the crops in demonstrating practices.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations	
	Class	Other
1. The Local Flower Market.	4	2
2. Selecting, Scheduling and Ordering	8	2
3. Demonstrate Growing Practices	2	12
	14	16

Revised June, 1974

MODULE OF INSTRUCTION

Title - SCHEDULING GREENHOUSE CROP PRODUCTION Code - 01.0599-07

OBJECTIVES to be obtained:

The student will be able to:

1. List the holidays and seasons that generate substantial market demand for greenhouse crops.
2. List the greenhouse crops in demand for each holiday or season.
3. List ten cut flower crops and ten potted flower crops that make up the bulk of flowers sold in the area.
4. List names and addresses of at least two wholesale flower markets and five retail florists in the area.
5. Write a production schedule to grow a crop of "mums" to mature for a specific holiday.
6. Write a production schedule of crops for one bench for one year.
7. Prepare an order for cuttings, plants or seeds for production on one bench.
8. Demonstrate importance of certain practices related to crop maturity dates.

Title - SCHEDULING GREENHOUSE CROP PRODUCTION

AGRICULTURAL

01.0599-07

OBJECTIVES BY UNIT	CONTENT
Unit 1. - The flower Market Objective #1. List the holidays and seasons that generate substantial market demand for greenhouse crops. Objective #2. List the greenhouse crops in demand for each holiday or season. Objective #3. List ten cut flower crops and ten potted flower crops that make up the bulk of flowers sold in the area. Objective #4. List names and addresses of at least two wholesale flower markets and five retail florists in the area.	A. Special holidays B. Seasonal market demands C. Special occasions D. Wholesale Market E. Retail Florist market
Unit 2. - Selecting, Scheduling and Ordering Objective #5. Write a production schedule to grow a crop of mums to mature for a specific holiday.	A. Potted or cut B. Standard or pom pom C. White, yellow or pink D. Particular variety or type

EDUCATION

Module SCHEDULING GREENHOUSE CROP PRODUCTION 01.0599-07

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Read and discuss parts of chapters 31,32,34 and 35 of The Retail Florist Business by Pfahl. . The 7 special holidays and the flowers most used for each. . The seasonal market and special occasions and the flowers most used for each. . Major flowers for each occasion B. Get local florist as speaker or visit his shop.	A. Read the chapter and: . list the 7 main holidays . for each major holiday and occasion, list the number 1 flower and list other main flowers used. B. Read parts of chapters 31,32 & 34 and list the major flowers for each occasion. C. Check his choice of flowers against those listed from this book. D. List the wholesale sources of his flowers E. List names and addresses of at least 2 wholesale and 5 retail florists.	Written or oral test - A. List the seven main holidays and the number 1 flower for each one. B. List names and addresses of two wholesale flower markets and five local retail florists.
A. Make initial management decision via class discussion to determine potted or cut standard or pom pom, color and type. B. Assign Glockner Mum Manual and demonstrate how to nail down a variety and schedule	A. List the mum types, the uses of each, and which are most grown. B. Determine that white yellow and pink are the main 3 colors and why. C. Select a variety for each of the 3 colors. D. Write a schedule to hit Christmas. (include plant pinch light)	C. Use mum manual to select a variety and write a schedule to meet an assigned holiday.

OBJECTIVES BY UNIT	CONTENT
Objective 6 - Write a production schedule for one bench for one year.	A. List the main crops grown locally as identified in unit 1 of this mod. B. For each, record the time to plant to hit each major holiday. C. For each, record the length of time from plant to harvest in each season.

Module SCHEDULING GREENHOUSE CROP PRODUCTION 01.0599-07

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Visit a local greenhouse and determine a year round schedule that he follows for 1 or more houses (or benches.)	A. On field trip record the operations schedule or schedule as accurately as greenhouse owner will define it.	
B. Assign Ball Red Book to get plant and harvest dates of the desired crops.	B. Study Ball Red Book and Glockner Manual: • **For** each main crop grown locally as defined in unit 1 of this mod. Record the time to plant to hit each holiday for which it is grown. • **For** each main crop record the length of time from plant date to harvest date in each season.	
C. Assign Glockner Mum Manual to get mum schedule for year-round mum production.	C. Decide which crops to grow - (management via democratic process works here)	
D. Class discussion to determine desired crops for each season and get agreement on temperature the house will be kept, (cold or warm house)	D. Record each schedule developed in class discussion.	D. Using student's notes, write a year round schedule for one bench, growing crops that are special for certain holidays.
E. Demonstrate with class discussion input: . Year round mum cropping schedule . Year round schedule using crops that are special for certain holidays.	E. Write a year round mum schedule using a different type mum than used in the demonstration.	
	F. Write a year long schedule using crops that are special for certain holidays.	

OBJECTIVES BY UNIT	CONTENT
Objective 7 - Prepare an order for cuttings, plants or seeds for production in one bench.	A. Review scheduling process in objective 2 above. B. Select color, variety and number of cuttings. C. Write order.

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Discussion . Review scheduling process . Settle on color(s) and a good variety . Notice the schedule and whether it can work for the class. (Do production practices like planting fall on a weekend)	A. Record variety and schedule of practices selected by the class.	
B. Assigned reading mum manual or Ball Red Book . Approved spacing of pots per bench and cuttings per pot or cuttings in bench if cut flowers.	B. Record spacing of cuttings in bench or pot and pots on bench.	
C. Measure bench to be used for crop.	C. Determine number of rooted cuttings needed: . Measure bench . Divide area of bench by area needed for each pot or cutting . Measure off bench to get exact placing of pots or cuttings so number of rows come out even at edge of bench.	E. Calculate number of cuttings needed for the bench.
Use Ball, Yoder, Glockner or other catalog and discuss . Minimum order size . Time required from order to delivery . Price . Discounts for early order . B.G.A. contract	D. Write order for the mums to be planted for next crop.	

OBJECTIVES BY UNIT	CONTENT
Unit 3. - Demonstrate Growing Practices Objective #8. Demonstrate importance of certain practices related to crop maturity dates.	A. This vital and exciting portion of ornamental horticulture is best learned by growing the crop right, and contrasting results when 1 practice is varied on 1 portion of the bench. The practices which show most dramatically include these - . Shading (photo periodism) . Lighting (a. photo periodism) (b. intensity) . Soil drainage . Temperature . Planting depth . Fertilization and watering

EDUCATION

Module SCHEDULING GREENHOUSE CROP PRODUCTION 01.0599-07

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Set up growing demonstration (s) to show practices listed under content. . Part of the crop must be grown right . A small part of the crop should have 1 practice varied.	A. Plan demonstrations-maybe individuals or teams take responsibility for specific demonstrations.	
B. Accurate records must be kept and practices should be lettered on signs so all can observe.	B.Report plans to class and get suggestions.	
C. Class must be taken to demonstrations often to view results.	C.Get instructors okay.	
D. Demonstrate techniques of observing, measuring, recording, summarizing and reporting results of various greenhouse cultural practices.	D. Letter signs.	
	E. Plant and grow crop.	
	F. Make periodic observations and measurements.	F. . List demonstrated production practices which slow or speed plant growth. . For each practice, list the variation from approved practice. . For each variation, define whether crop growing period is shortened or lengthened.
	G. Record measurements and observations.	
	H. Summarize and report measurements observations and conclusions to the class.	

MODULE OF INSTRUCTION

Title - SCHEDULING GREENHOUSE CROP PRODUCTION Code - 01.0599-07

RESOURCE MATERIALS

Books:

Ball Red Book (Geo. Ball staff)
Glockner Mum Manual
Glockner Carnation Manual
Cornell Manuals - Carnations
" " - Mums
" " - Snaps
Penn State Manual - Poinsettia
" " " - Gernaniums
Ball Mum Technical Manual 310
Interstate The Retail Florist Business, by Peter Pfahl

Bulletins:

Cornell Lily Forcing
" 1175 Fertilizer Proportioners
" Recommends for Commercial Floriculture Crops

Periodicals:

Grower Talks - Geo. J. Ball

MODULE OF INSTRUCTION

Title - PREPARING FLOWERS FOR SALE Code - 01.0599-08

DESCRIPTION:

In this module, the students will market greenhouse grown cut flowers and potted flowering plants. They will cut, grade, condition and pack cut flowers. They will also prepare, decorate, wrap and display potted flowering plants. This module will introduce students to the sales of floral products.

MAJOR DIVISIONS OR UNITS OF CONTENT	Time Allocations Class	Other
1. Cutting and conditioning cut flowers	2	2
2. Grading and packing cut flowers	2	6
3. Prepareand wrap potted flowering plants	2	6
4. Display of potted flowering plants	4	6
	10	20

Revised June, 1974

MODULE OF INSTRUCTION

Title - PREPARING FLOWERS FOR SALE Code .01.0599-08

OBJECTIVES to be obtained:

The student will be able to:

1. The student will select and cut flowers from the greenhouse bench.
2. The student will grade cut flowers according to trade standards.
3. The student will condition cut flowers for wholesale handling.
4. The student will pack cut flowers for sale or delivery.
5. The student will prepare, gift wrap and cold wrap potted flowering plants for delivery.
6. The student will tag and display potted flowering plants.

AGRICULTURAL

Module PREPARING FLOWERS FOR SALE 01.0599-08

OBJECTIVES BY UNIT	**CONTENT**
UNIT 1. Cutting and Conditioning	A. Determine correct time of cut . Time of day . Stage of flower bloom
Objective 1 The student will select and cut flowers from the greenhouse bench.	B. Cut and carefully handle flowers . Equipment to cut and hold flowers . Protecting the bloom
	C. Prepare flowers for storage . Even stems . Crushed woody stems . Stripped foliage
	D. Proper Storage Conditions . Temperature of water . Temperature of cooler . Humidity, light, air movement

EDUCATION

Module PREPARING FLOWERS FOR SALE 01.0599-08

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Demonstration with flowers cut at various stages and times during day	A. Student will cut flowers grown in school greenhouse	A. A written or oral test . Student lists the correct timing in "Stage of Bloom" to cut various flowers
B. Discussion of observations from demonstration		
C. Demonstration of proper cutting, including proper use of equipment Care in handling bloom		
D. Demonstration with flowers conditioned properly (compared to flowers conditioned properly except for 1 variable such as temperature)	B. Students will prepare flowers for conditioning and store them properly	B. Student lists conditions for proper conditioning of various flowers

Title - PREPARING FLOWERS FOR SALE
Code - 01.0599-08

OBJECTIVES BY UNIT	CONTENT
Unit 2. - Grading and Packing Objective #2. - Student will grade cut flowers according to trade standards.	Grading . Economic importance . pricing . trust in the trade . Cut flower grades . stem length . weight . number of stems . stage of bloom . size and length of bloom
Objective #3. - The student will condition cut flowers for wholesale handling.	A. Succulent flowers B. Milky sap stemmed flowers
Objective #4. - The student will properly pack cut flowers for sale or delivery.	Packing - wholesale and retail . Containers - boxes, and lining . Methods - Layered, upright, individual . Preservatives

EDUCATION

01.0599-08 - Code

PREPARING FLOWERS FOR SALE - Title

TEACHING METHODS	STUDENT APPLICATION ACTIVITIES	EVALUATION PROCEDURES
A. Field trip to wholesale flower market.	A. Students observe quality of various flowers in the various grades.	A. Written or oral test 3 - list qualities of top grade for two cut flowers (important locally)
B. Study and discuss grade standards in the trade. Use transparency - showing standards	B. Students note volume of sales and prices of different grades.	B. Student correctly grade a cut flower.
	C. Students grade flowers which they cut in unit one of this module.	C. List requirements of top grade for three flowers (important locally)
	D. Students list requirements for top grade on each of the top three flowers in the local market.	
A. Succulent stems are cut ½" and placed in 100° water.	Students prepare categories of flowers according to succulent and milky stems.	Students can condition succulent and milky stemmed plants.
B. Sappy or milky stems are placed directly in ice water.		
A. Field trip to wholesale grower who is grading and packing cut flowers.	A. Student note method of packing and tips for doing it correctly.	Student will properly pack one box of cut flowers.
B. Demonstration of packing of the flowers cut in this module.	B. Students pack flowers which they cut and graded in this module.	

AGRICULTURAL

Module PREPARING FLOWERS FOR SALE 01.0599-08

OBJECTIVES BY UNIT	CONTENT
UNIT 3. Prepare and wrap potted flowering plants Objective 5 - The student will prepare cold wrap and gift wrap potted flowering plants for delivery.	A. Selecting plants for sale . Sell only healthy plants . Time of week and near holiday . Stage of bloom to look nice now and last long B. Clean it up . Remove old flowers and dead leaves . Trim broken parts . Clean pot A. Selecting the dress up and protection materials used - foil, ribbon, tissue, plant sleeves, picks, tags, etc. B. Application of dress up wrapping C. Preparation for cold weather delivery

Module___ PREPARING FLOWERS FOR SALE ______________ 01.0599-08

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Field trip to local florist not just before a holiday	A. Student observes and records the good and bad plant conditions that he sees	
B. Demonstration . To select plant in right stage of sale . To show clean up	B. Student	
C. Discussion of the preparation and wrapping process and the economics involved		
A. Note and discuss observations made in field trip in this unit to florist shop	A. Student observes and notes job of gift wrapping, addition of ribbons (for objective 2 of this unit)	. Select potted plant ready for sale . Clean up plant . Gift wrap . Tie and attach bow . Cold wrap for delivery
B. Demonstrations . Gift wrap . Making and attaching a bow . Cold wrapping for delivery	B. Student selects and cleans up several potted plants to preparefor wrapping	
	C. Student discusses and records the costs of typical plant dress up and the local price which results	
	D. Student . Gift wraps some potted plants . Prepare and attach bow . Cold wrap for delivery	

AGRICULTURAL

Module PREPARING FLOWERS FOR SALE　　　01.0599-08

OBJECTIVES BY UNIT	CONTENT
UNIT 4. Display and sell flowering potted plants **Objective 6** - The student will tag, display, and maintain potted flowering plants.	A. **Review merchandising techniques** B. **How to make and attach a tag** C. **Arranging an attractive display of flowering plants** D. **Maintaining plants in retail sales area** E. **Selling Techniques** . **Know the product** . **Know the customer** . **Get the two together**

EDUCATION

Module PREPARING FLOWERS FOR SALE 01.0599-08

TEACHING METHOD	STUDENT APPLICATION ACTIVITY	EVALUATION PROCEDURES
A. Field trip to a good, active retail florist . To observe his displays of flowering potted plants. What displays appealed most? . Get his ideas on placing plants for greatest appeal . How does he provide the optimum light, water, temperature, humidity?	A. Observe and record the displays and characteristics of displays which were most appealing B. Record his ideas on placing plants C. Record ideas for maintaining optimum light, water, temperature, humidity	
B. Discuss information to put on a plant care tag.	Record plant care information tags	
C. Discuss price and how to arrive at a fair price	A. Prepare and attach identification, price, and plant care tags to plants	A. Prepare and attach a tag to gift plant
D. Demonstrate how to prepare and attach a tag	B. Prepare 4 displays of flowering plants for retail sale	B. Prepare a display of potted flowering plants for sale
E. Demonstrate good and bad displays		
A. Discussion . The qualities of each plant to be sold in the retail area . Uses for each of the plants in the home . Greeting customer, giving information closing sale . Final handling of the plant . Recording the sale and making change	A. Record from discussion the tips needed to . Greet customer . Give information . Close sale . Record sale and make change	
B. Role play to practice and demonstrate selling techniques	B. Sell plants From the retail sales area (or role play if necessary)	

MODULE OF INSTRUCTION

Title - PREPARING FLOWERS FOR SALE Code - 01.0599-08

RESOURCE MATERIALS **BOOKS -**

The Retail Florist Business, Peter Pfahl, Interstate
The Ball Red Book, George J. Ball Staff 1965
Flower and Plant Production, Kennard S. Nelson
Chrysanthemums Cornell Manual, Robert Langhans, editor
Poinsettias, Ohio Agricultural Experiment Station, Wooster, Ohio
Snap Dragons, Cornell Manual, Robert Langhans, Editor
Carnations, Cornell Manual, Robert Langhans, Editor

BULLETINS

Wholesale Flower Sales - Cornell Bulletin
Retail Flower Sales - Cornell Bulletin

PERIODICALS

Florist Exchange
Florist Review
Florist Magazine (F.T.D.)
Flower Talks - George Ball, Inc.

AUDIOVISUALS

Film - Colorado Carnation Growers